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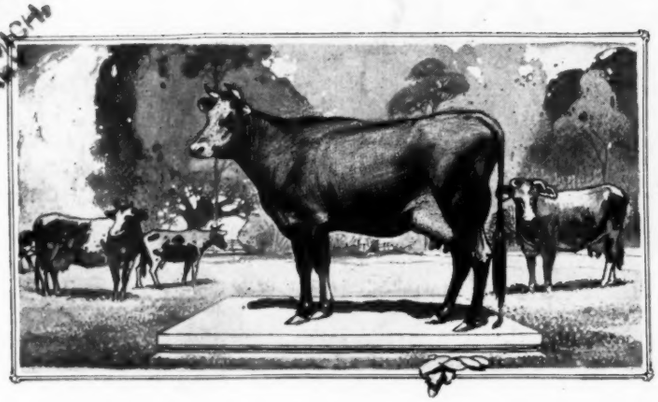

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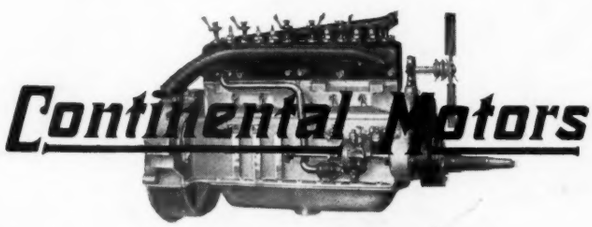

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Stewart

Motor Driven Warning Signal

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A Stewart Warning Signal is an asset on any car—
The lack of it a liability.
Which class do you think best—which safest?

"No car is better than its accessories"

The Stewart-Warner Speedometer Corporation
Chicago, Ill., U. S. A.

$6

The AUTOMOBILE

VOL. XXXV NEW YORK—THURSDAY, JULY 27, 1916—CHICAGO No. 4

Stromberg Under New Control

Allan A. Ryan and Banking Syndicate Charter New Company

ALBANY, N. Y., July 22.—A charter has been granted to the Stromberg Carburetor Co. of America, under the control of Allan A. Ryan & Co., and a syndicate of prominent banking interests in New York City, which recently incorporated the Stutz Motor Car Co. The directorate of the new company includes William Rand, E. F. Meniken and K. R. Howard, the first two being connected with the law firm of Jerome, Rand & Kresel, 37 Wall Street, New York City.

The company has issued 50,000 shares of no par value and will do business with $250,000.

The stock has been listed on the New York City curb and was traded last Thursday on a "when issued" basis. On the turnover of 1500 shares in this issue all but 100 shares changed hands at the subscription price of 42. Before the close of trading it was announced that the stock had been oversubscribed.

—

Hall Resigns from Olds

LANSING, MICH., July 22—J. B. Hall, sales manager of the Olds Motor Works, this city, has resigned. Mr. Hall has conducted the selling of Oldsmobiles for a number of years and is a well known figure in the industry. His future plans have not been announced, nor has his successor yet been appointed.

—

Baker Visits United States

NEW YORK CITY, July 22—Fred W. Baker of the Baker Rim Co., Ltd., Stourbridge, England, manufacturer of the Rebak rim for automobile wheels, arrived on the Baltic to-day and expects to spend a month in this country investigating the automobile rim business. Mr. Baker has made several previous trips to this country visiting our automobile shows.

—

Waldon Resigns from Cadillac

DETROIT, MICH., July 24—Sydney D. Waldon, vice-president in charge of engineering of the Cadillac Motor Car Co., has resigned. His future plans are not given out but it is not believed that he will again enter the automobile industry actively. Mr. Waldon has had a wide experience in the automobile business, relinquishing his position as vice-president of the Packard Motor Car Co. to go to the Cadillac company about a year and a half ago.

—

Hinckley Heads Chalmers Production

DETROIT, MICH., July 22—Following the resignation of S. H. Humphrey, as production manager of the Chalmers Motor Co., C. C. Hinckley, chief engineer of the company, has taken over the production department in addition to directing the engineering work of the company.

—

Hackett Four at Under $1,000

JACKSON, MICH., July 21—Following the change in name of the Argo Motor Co., Inc., to the Hackett Motor Car Co., as reported last week in THE AUTOMOBILE, comes the announcement of a new model to be known as the Hackett four. While none of the details have been made public, it is stated that the car is built to look like a speed boat and is sturdy of construction, light in weight and beautiful in design. The price will be under $1,000.

—

200,000 Cars in Illinois

SPRINGFIELD, ILL., July 22—The 200,000 mark has been passed in car registrations in Illinois.

French Makers Plan Cheap Cars

$50,000,000 Company Being Formed to Produce These in Quantity

PARIS, July 12—There are indications that immediately after the war some of the leading French automobile manufacturers will endeavor to get into the low-priced car trade and produce an automobile for the European and Colonial markets capable of competing with Ford on a price basis. Arrangements are in hand for the formation of a $50,000,000 company at Lyons to produce cheap cars only. It is declared that Renault and Berliet, two of the leading automobile manufacturers of France are interested in this concern. A Lyons body builder is interested in the body section of the new factory and is about to visit America for the purpose of getting information and arranging for the purchase of machinery for producing bodies on a big scale.

Popular report credits other manufacturers with the intention of going into the cheap car business. Among the names mentioned is an important firm which had specialized in gearcutting before the war and has since increased its staff from 3000 to 15,000. Factory development during the war has been phenomenal. One typical case is that of a well-known manufacturer who just before the war completed a new factory and laid plans for additions to be added during a period of 15 years. In the 2 years of the war he has attained the maximum he hoped to reach in 15 years and has had to buy new ground. As all French automobile and kindred factories have increased since the war from 30 to 300 per cent, there is an impression that the possible output of cars will be

considerably above the demands unless fresh ground is struck. There is a great danger of over-production when the new munition factories return to their ordinary work, and in some cases arrangements are being made to abandon automobiles for other branches of engineering. Marine engines, particularly Diesel type, are looked upon as a good field, and are said to be attracting some automobile manufacturers.

Ford's European Plants

The French Ford Co. has purchased land at Bordeaux on which to build an erecting factory, knock-down chassis from the Detroit factory will be assembled here as soon as possible. It is well known, however, that Ford has secured a big tract of land at Southampton where all cars for the European market will be produced. The English factory will then supply Bordeaux with units, and the Ford will enter France as a British car.

—

Suit Against Faw Dismissed

NEW YORK CITY, July 24—A patent infringement suit for a bulb reflector, brought by Nelson J. Quinn against J. H. Faw, Inc., has been dismissed in the United States District Court. The patent is No. 1,099,715. The construction in question is that of half the bulb being covered by a silver coating. The Faw device is a detachable metal covering, and not a coating upon the glass. The element of adjustability also entered into the question.

—

Fire in Gibson Plant

INDIANAPOLIS, IND., July 22—Fire which was caused by defective electrical wiring last night burned out the third floor of the Gibson Co.'s plant. This contained motor car parts and some accessory stock. The loss is approximately $85,000. Business, however, was not at all delayed. The company opened as usual this morning, adjusted itself to conditions, and its service system continued to operate as usual. Manufacturers assisted the jobbing company greatly by expressing a duplicate of the stock that was damaged, and this, with the reserve stock in warehouses, served to overcome the difficulty.

—

Sells Out Ziola Carbureter

MADISON, WIS., July 24—Henry A. Ziola, Madison, Wis., an inventor of electrical and carbureting devices for internal combustion engines, has sold all rights to the Ziola kerosene carbureter to a syndicate of St. Louis capitalists, headed by James B. Lloyd. It is said that Ziola received $30,000 for his patents. He is the inventor of an X-ray machine now being manufactured at Madison.

Europe Establishes Standards

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England Has Standard Truck Design—Cars and Aviation Engines Affected

LONDON, July 12—Automobile standardization has been developed to such a degree that England is now prepared to produce a single type of truck in all factories for the use of her own and allied armies. Drawings and jigs will be supplied by the central authority to all the factories required to build trucks, and these factories will be obliged to build to this design, to the exclusion of their own models. A big series will go through immediately, and, it is declared, the output will be so great there will be no further need for American trucks.

The new design is a 3 to 4 ton model with four-cylinder engine of 5 by 6 in. bore and stroke. It has a four-speed gearbox and final drive by overhead worm. Hotchkiss drive is not incorporated. Ignition by high-tension magneto only is fitted; it is no longer considered necessary to have a secondary ignition by batteries. All-metal wheels are employed, both of the cast steel and pressed steel types. It has been necessary to adopt the two types on account of the big output contemplated.

Nothing Freakish in Design

In designing this truck everything freakish has been avoided and only features which have proved satisfactory under actual war conditions have been incorporated. The 5 by 6-in. four-cylinder engine gives a bigger piston displacement than is usually considered necessary for a 3 to 4-ton load under either English or French conditions. It is intended, however, that the new truck shall be as suitable for Russian service as for work on the French front, hence the more powerful engine. The design has been developed by an engineer who has had experience of all makes and who has enjoyed exceptional opportunities of observing the defects of trucks under war conditions. Obviously engineers with vested interests find much to criticize in the new design, but the authorities override all their objections and insist on everybody producing the one type of truck.

Standardization has not been confined to trucks. One firm having been very successful on aviation engines has been ordered to devote the whole of its plant to the production of these engines and to hand its touring car drawings and jigs to a rival firm of lesser importance. Such a course does not meet with the approval of the more important firm, for it is obliged to give away all its secrets to a concern which will be a rival after the war.

Germany has also realized the advantage of standardization. For a considerable time now she has specialized on two types of aviation motors, Mercedes and Benz, built in every available factory. In each case the motors are six-cylinder vertical water-cooled with valves in the head. The only exception to this scheme is the Oberursel, a copy of the French Gnome, used on Fokker scout machines.

German water-cooled aviation engines Mercedes and Benz, are all fitted with an indicator by means of which the pilot can ascertain the temperature of the cooling water. The Daimler-Mercedes Co. states that the maximum temperature of the water at the outlet from the cylinders should be 75 deg. Ordinary thermometers have not been found satisfactory and use is now being made of an electric telethermometer made by Hartmann & Braun, of Frankfort-on-Main. The apparatus consists of a metal piece immersed in the cooling water, and within this piece a spiral receptor of the temperature. Just in front of the pilot's seat is a galvanometric indicator connected to the temperature receptor by a suitable wire cable. The needle and the scale of the galvanometer are very clearly marked, the apparatus is entirely automatic and is not influenced by vibration.

Current is obtained from a small storage battery or from dry cells with interrupter. The thermometer portion of the appliance consists of a platinum spiral within a metallic armature. The apparatus is based on the principle of the ohmmeter. A water temperature indicator has proved of immense value in the aviation service. A large number of accidents have been traced to overheating which was not observable by the pilot until too late. Such an instrument is particularly valuable in the case of planes with more than one engine.

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McComb Resigns from G. V.

NEW YORK CITY, July 22—H. C. McComb has resigned as engineer of the General Vehicle Co., Long Island City, to take up other engineering work and has opened offices at 1414 Times Building, this city.

—

N. A. C. C. Meets at Christmas Cove

CHRISTMAS COVE, ME., July 25—Officers and directors of the National Automobile Chamber of Commerce, Inc., are enjoying their annual sojourn here as the guests of Samuel A. Miles. The chamber is holding its summer meeting here as usual, business at the directors' meeting held to-day being mostly of a routine nature, although plans for the national automobile shows were discussed

and various schemes for decoration, etc., talked over. The patent situation also came in for a share of attention.

The party is combining pleasure with business, holding fish fries, clam bakes and general sports.

The directors and guests in attendance included President Charles Clifton, C. C. Hanch, H. H. Rice, John N. Willys, Wm. E. Metzger, J. Walter Drake, Windsor T. White, George Pope, H. M. Swetland, Alfred Reeves, Thomas Henderson, S. A. Miles, Charles E. Thompson, Wm. M. Sweet, John C. Wetmore, A. G. Batchelder, Thomas J. Wetzel, R. D. Garden, Charles Thaddeus Terry and Frank R. Nickerson.

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Alvord Succeeds Hendee

NEW YORK CITY, July 26—J. F. Alvord, head of the Torrington Co., has succeeded George Hendee as president of the Hendee Mfg. Co., motorcycle manufacturer in Springfield, Mass.

—

Sulzberger Changes Name to Wilson

CHICAGO, ILL., July 20—Sulzberger & Sons Co., this city, maker of curled hair for automobile upholstery, has changed its name to Wilson & Co.

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Newton Joins Hollier Maker

JACKSON, MICH., July 20—F. L. Newton, assistant sales manager of the Jackson Automobile Co. for the past 5 years, has resigned to become general sales manager for the Lewis Spring & Axle Co., Chelsea, Mich., manufacturer of the Hollier eight.

—

Pennington Joins Brunswick-Balke

MUSKEGON, MICH., July 25—A. J. Pennington, who for 6 years was general superintendent of the Lee Tire & Rubber Co., of Conshohocton, Pa., has been made factory superintendent of the Brunswick-Balke plant at Muskegon according to an announcement made yesterday by J. E. Duffield, sales manager of the new tire concern. He will assume charge of the Brunswicke-Balke plants on Aug. 1.

Brunswick-Balke will triple the output of tubes and casings originally planned.

—

McBride and Conlon Promoted

DETROIT, MICH., July 22—V. K. McBride, who has been in the sales department of the Federal Motor Truck Co. for over 2 years, has been appointed assistant sales manager of the company. H. A. Conlon, formerly a special sales representative of the Federal company in England, has been promoted to the position of field sales manager.

—

Acme Joint to Build

KALAMAZOO, MICH., June 20—A new factory building, 76 by 201 ft., will be erected for the Acme Universal Joint Co., which will cost about $20,000.

Kelsey and Herbert in Merger

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Form Kelsey Wheel Co., with $13,000,000 Capital—John Kelsey President

DETROIT, MICH., July 22—The consolidation of the Kelsey Wheel Co., with plants at Detroit and Memphis, Tenn.; the Kelsey Wheel Co. of Windsor, Ont., and the Herbert Mfg. Co., Detroit, practically has been completed, the new corporation to be known as the Kelsey Wheel Co., Inc., with a capital stock of $13,000,000, composed of $3,000,000 of 7 per cent accumulative preferred stock and $10,000,000 of common stock.

John Kelsey is to become president of the new corporation, but the rest of the officers have not yet been determined. Control of the new organization will remain with Mr. Kelsey and associates.

Few realize the magnitude of the Kelsey interests, both here and in the South. At the main Kelsey plant in this city, twenty-five sets of wood wheels are produced daily, complete with rims. In the making of automobile rims the Kelsey company now ranks at the top and utilizes 150 tons of steel per day for this product alone. The Herbert Mfg. Co. makes 500 automobile bodies per day, besides finishing and trimming a large proportion of them. This plant is also a very large producer of a variety of steel stampings required in the manufacture of motor vehicles. The Memphis, Tenn. plant of the Kelsey company represents an investment of $500,000 and is the factory at which the hickory used in the manufacture of the wheels is concentrated. It is here worked into spokes and felloes, the completed wood wheels then being sent to Detroit where they receive their steel rims. The Kelsey company located in Windsor, Ont., is a separate corporation, but includes most of the same stockholders. It is the Canadian car manufacturers' main source of wheel supply. The Detroit Kelsey company has an authorized capital stock of $1,500,000, all of one class, and $900,000 of this is outstanding.

The preferred stock of the Kelsey combination is underwritten by Sachs, Goldman & Co., New York bankers, and the common is said to have been oversubscribed. In the organization plan their is provision for retiring to preferred stock at the rate of $90,000 per year. It is proposed to make the consolidation effective from Jan. 1, 1917.

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Falls Machine Under New Control

MILWAUKEE, WIS., July 22—A well-defined report from Sheboygan Falls, Wis., says that the Falls Machine Co., Sheboygan Falls, manufacturer of small, high-speed gasoline engines for car builders, has passed into the control of a syndicate represented by Andrews & Co., bankers, Chicago. It is stated further that the company will be reincorporated as the Falls Motors Co., under the laws of Virginia, with a capital stock of $1,500,000. The company has made extensive additions during the last 8 or 10 months and at this time is still further enlarging the capacity. One of its largest contracts is that for all motors for the Grant Six.

—

Ferguson Resigns from G. M.

DETROIT, MICH., July 20—D. M. Ferguson has resigned as consulting engineer for the General Motors Co., and his plans have not been announced. Previous to his connection with the General Motors, Mr. Ferguson was chief engineer for the Studebaker Corp.

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Walker Becomes a Chandler Engineer

CLEVELAND, OHIO, July 24 — Hiram Walker has been appointed assistant engineer of the Chandler Motor Car Co., this city. He was previously connected with the Enger Motor Car Co., Cincinnati, Ohio, in the same capacity.

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Moss Joins Thomas Truck

NEW YORK CITY, July 26—J. L. Moss, M. E., has resigned as designing engineer of the International Motors Co., and has joined the Thomas Auto Truck Co., this city, as chief engineer.

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Jehle with Aluminum Castings Co.

CLEVELAND, OHIO, July 22—Ferdinand Jehle has resigned as laboratory engineer of the Automobile Club of America, New York City, to assume the position of service engineer with the Aluminum Castings Co., this city.

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Horning and McKinley Councillors

NEW YORK CITY, July 24—In the list of new S. A. E. nominations giving the officers of the coming year there appear the names of Harry L. Horning, Waukesha Motor Co., and Charles W. McKinley, Willys-Overland company, who are nominated as councillors to serve for 2 years.

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Martin, Burd Ring V.-P., Retires

ROCKFORD, ILL., July 22—A. A. Martin, vice-president and sales manager of the Burd High Compression Ring Co., this city, and who organized this company, will retire from that concern Aug. 1.

—

France Orders 600 Moreland Trucks

LOS ANGELES, CAL., July 20—W. L. Moreland, manager of the Moreland Motor Truck Co.'s factory, this city, announced to-day that the War Department of the French Republic had cabled an order for 600 Moreland trucks.

South America

U. S. A. Cars Selling Well in Country—Big Gains in Last Year

Argentine Farmer Shown Our Cars Can Stand Up Where Roads Are Poor—European Car Business at Standstill

By David Beecroft

MEDIUM and low-priced U. S. A. cars are selling in Argentina, in parts of Brazil, in Uruguay and Chile in steadily increasing quantities. This selling movement started approximately 1 year to 18 months ago at a time it was least expected that U. S. A. cars would sell. The war had started, in general South American finances were in a deplorably bad condition, as such European countries as England, Germany, France, Italy and Belgium had stopped supplying the money that they had been supplying for 45 to 55 years. Further: It was at a time when these countries were in the second or middle stages of a financial crisis that started 2 years before the war, to be exact, in 1911, and which was only augmented because of the war.

A still further fact with regard to the starting of sales of U. S. A. cars was that it began at a time when every dealer in European cars had his salesroom and warehouse filled with European machines which had practically ceased to sell. The sale of expensive European cars stopped practically 4 years ago, and there are many salesrooms to-day filled with the cars they contained then. With the cheaper European cars it has been different: They have sold, but none has arrived to take their place since the war started, with the exception of Italian cars which were shipped in large quantities from the opening of the war until 1 year ago, when Italy became embroiled in the struggle and had need for all her machines in her own land.

Within the last 2 years the entire attitude of Argentina, parts of Brazil, Uruguay and Chile, and it may be other countries in South America, have changed toward the low and medium-priced U. S. A. cars. True, before that time we had sold cars in Argentina and Brazil. We have had agencies of U. S. A. cars continuously in Buenos Aires for 14 years. One dealer has had the Cadillac continuously for that time. Scores of our different makes of all prices are there, but with few exceptions they were not popular and did not sell on a scale to be compared with cars from France, Germany, England, Italy and Belgium.

Europe had the market almost entirely within its own grip. France, Germany, England, Italy and Belgium seized the market 15 years ago. When we were running our first Vanderbilt Cup race in Long Island these countries had already invaded Argentina and Brazil and such cities as Buenos Aires, Rosario, Cordoba, Mendoza and Tucuman had already learned of the automobile. Buenos Aires shows in its ancient cars older European machines than can be found in U. S. A. I visited one dealer's museum of automobile antiques to see a Benz made before the front axle was used, each front wheel being carried in a huge bicycle type of front fork. There are old Mercedes of nearly the same vintage, and very ancient Panhards, De Dions, Renaults, etc. Europe, for one reason or another, was earlier with its cars in South America than in the U. S. A. Perhaps this was due to the large investment of capital in these South American lands and the controlling interest that European capitalists had in nearly all of the large public utilities such as railroads, trolley systems, telephones, telegraph, factories, etc. Gen-

South American Series

THIS is the first of a series of articles on South America that will appear from week to week in THE AUTOMOBILE. *David Beecroft, Directing Editor of* THE AUTOMOBILE, *has just returned from a 3 months' trip through Argentina, Uruguay, and Southeastern Brazil, where he studied automobile conditions. Mr. Beecroft went as a member of a United States Government committee appointed for the purpose of developing more friendly trade relations between South American countries and the United States.*

While in South America he traveled extensively through the different countries, visited a majority of the concerns interested in the sale of automobiles and accessories, and made a comprehensive study of the possibilities of wider use of American automobiles, accessories, motor trucks, and farm tractors in these three countries of South America.

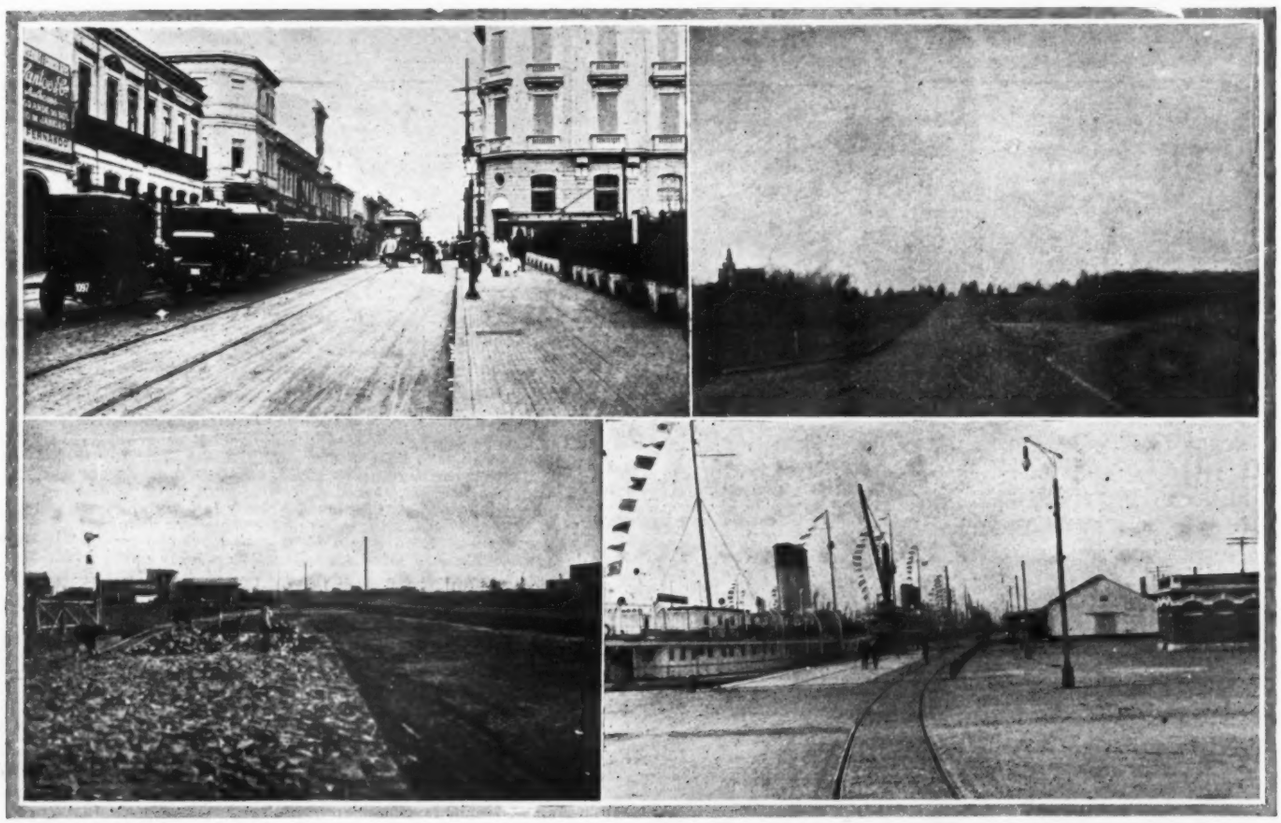
Additional articles will appear from week to week, taking up in detail the different factors entering into South American trade.

IF your conception of South America is from the maps you saw in your public school geographies, it will be well to revamp such. South America is not quite so large as North America but it has one country, namely, Brazil, which in area is about the same as the U. S. A. when Alaska is left out. Brazil, U. S. A., Canada, Australia and Europe are all about the same size, namely a little over 3,000,000 square miles. Keep in mind that Brazil is a huge country, and there they speak of the United States of Brazil just as we speak of the United States of America.

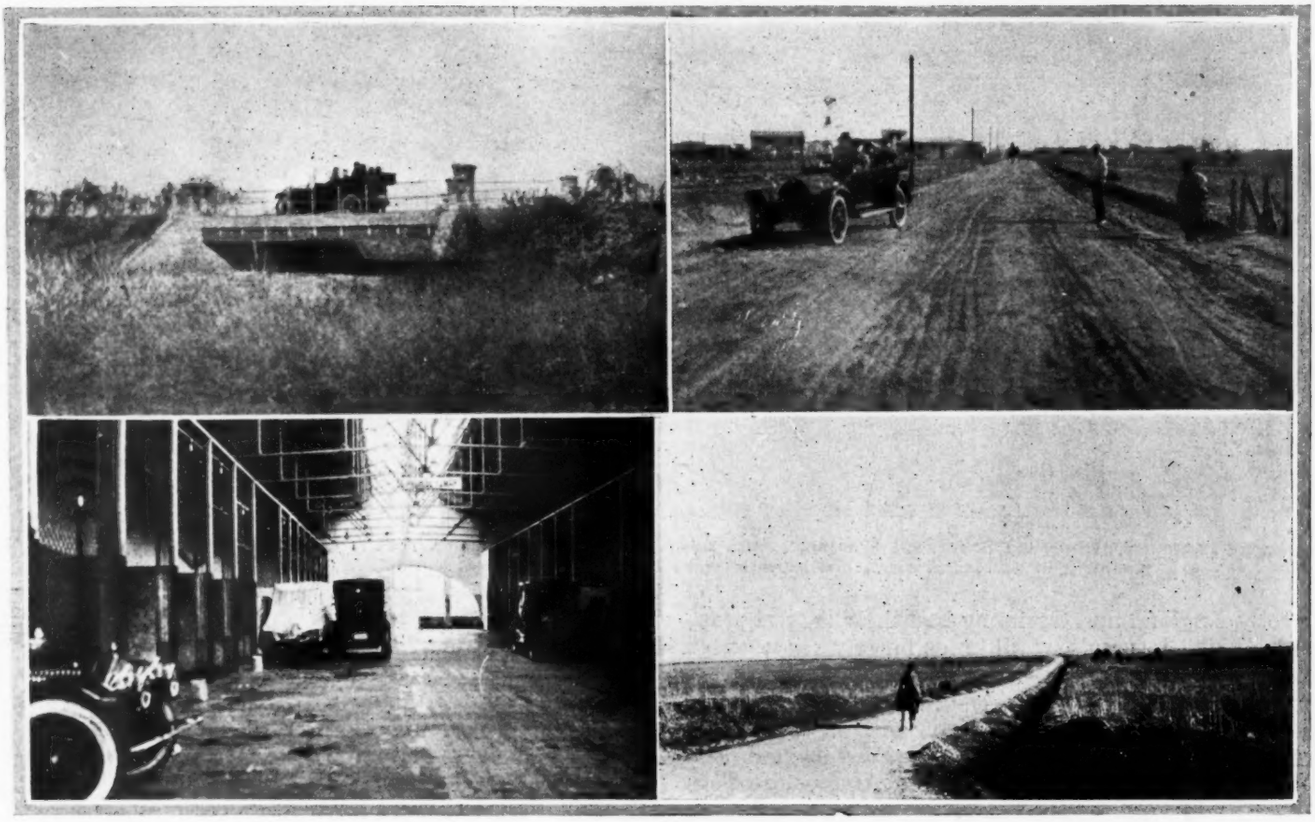
Argentina is smaller in area, but approximately the same as that of the U. S. A. east of the Mississippi River. At present Argentina and Brazil are the great possible market for U. S. A. cars, and the smaller countries like Chile and Uruguay are taking them in goodly quantities. In the other countries the advent will be slower as social and physical conditions are not so favorable. The east coast is naturally a more attractive selling field than the west coast, which is very narrow and generally hemmed in between the lofty Andes Mountains and the sea. There is a 2000-mile stretch on the west coast which is practically rainless. Immediately in from the west coast the land is from 10,000 to 12,000 ft. above sea level and, naturally, this high altitude has held back European settlement much more than in the great agricultural and grazing territories along the east coast.

Scenes of Country and City in South America

Typical landscape in Argentine farming and grazing country where U. S. A. low and medium-priced cars are selling so well at present. The country is level and very fertile. Argentine is one of the greatest stock raising countries in the world



Upper left—Street scene in Sao Paulo, Brazil, a city of 500,000 population, showing taxicabs lined up in center of street. The cabs are well distributed all over the business section of the city. They are all European, Berliet and Fiat being leaders
Upper right—Argentine has few roads. Here is a new stone block one 60 miles in length between Buenos Aires and the City of La Plata. This city is very modern, is a growing port and is capital of the Province of Buenos Aires. Armour and Swift packing plants are located in La Plata
Lower left—The heavy stone foundation used in the Buenos Aires-La Plata road, which was built by a French engineering company and will be completed in August, 1916, the work being rapidly advanced toward completion throughout its length
Lower right—A passenger dock in Buenos Aires for river traffic. Note wide, well-paved areas around the dock. This is general throughout the city, which in many other respects exhibits up-to-date characteristics and applications of modern ideas just as found in many cities in the U. S. A.



Upper left—Typical concrete and brick bridge on Buenos Aires-La Plata road. There are nearly two dozen of these very modern bridges in the 63 miles

Upper right—graded section of Buenos Aires to La Plata road ready for stone foundation on top of which is laid the stone block surface

Lower left—Type of public garage in Buenos Aires with individual stalls for cars. Each car is literally in a separate garage of its own

Lower right—Type of new national roads being built in Uruguay, one of the smallest countries in South America. Nearly 130 miles of this road has been built in one stretch and short stretches in other places. In 2 years a road of this character will span the country from Montevideo to the Brazilian boundary on the north. Roads such as these should prove marvelously efficacious as educational aids to dealers in U. S. A. cars in their efforts to render these cars popular in South America and the roads movement is rapidly growing stronger

Typical view of the country in Uruguay where U. S. A. low and medium priced cars are selling in goodly numbers. The country has very few roads and not enough bridges, but the government has planned a large road scheme and much progress has been made in the last 2 or 3 years

One of several examples of the high-class bridge construction being used on the new motor roads in Uruguay. This country is very ambitious in its road problems and hopes to make its roads the greatest touring fields of South America

erally England and Germany had their largest manufacturing interests of all kinds largely represented in South America and when the automobile started coming into prominence it did not require much extra effort to market the car, as they were generally sold by large houses that handled myriad lines of machinery either electrical, hydraulic, agricultural, mining or other kinds.

Progress from 1900 to 1911

Before going further into the present rapidly increasing sale of U. S. A. cars in South America look for one moment at the progress made from 1900 to 1911, when the financial crisis arrived, in the sale of European cars. To-day in Buenos Aires, Rosario, Cordoba, Bahia Blanca and other Argentina cities, in Montevideo, in Uruguay, and in Rio de Janeiro, Santos and Sao Paulo, in Brazil, you see thousands of all makes of European cars in use, the most expensive makes generally in greater quantities than the cheaper ones.

Buenos Aires has finer European cars than New York, Boston, Philadelphia and Baltimore. You see every known French, German, Italian, Belgian and very many English makes in all the cities mentioned. There are scores of makes scarcely heard of and rarely if ever seen in the U. S. A. Take Italy, for example, and such cars as S.P.A., Scat and Itala, some of which have never been seen in New York or Boston, the U. S. A. hotbeds for European cars some years ago, are seen in large quantities in Buenos Aires, Rio, Montevideo and Sao Paulo, and the natives speak of them with greater familiarity than of many of our popular cars selling under $1,500. There are such German makes as Adler and Horsch, never seen in the U. S. A., such French makes as Gregoire, Berliet, Peugeot, Alcyon and other names such as N.A.G., Lloyd, Pipe, F.N. and many others unknown in the automobile fraternity in the U. S. A. Not only has Buenos Aires these makes in quantity but she is literally filled with the more popular European makes such as Renault, Panhard, Clement-Bayard, Delaunay-Belleville, DeDietrich, Benz, Mercedes, DeDion, English Daimler, Rolls-Royce, Napier, Wolseley, Fiat, Isotta Fraschini, Metallurgique, Martini and every other European name known in the U. S. A.

Let it be repeated again that Buenos Aires and Rio have finer cars than New York City. Stand near Florida (Floor-e-da) the fashionable shopping street of Buenos Aires on which no vehicles are permitted between 4 and 7 and you see an array of limousines and landaulets, touring cars and open types grander than on Fifth Avenue. The cars are generally the last word in body design and fitting. Many dealers had all their bodies built by Van den Plas, Rothschild and the best European builders. The Argentine is fond of externals. Parade attracts him. He wants the best in automobiles; no matter what the chassis is, the body has to be the best. The limousines are large, hundreds are finished interiorally in the best cabinet woods with delicate inlaid work and they are as immaculate today as when first purchased. The automobile is a great criterion of social status not only in Buenos Aires but in many other South American cities. No car is too good for the wealthy Argentine. To-day his chauffeur and footman are better groomed than those seen on Fifth Avenue, New York, Commonwealth Avenue, Boston, or Michigan Avenue, Chicago. They, too, like the car, are immaculate.

Why European Cars?

The cities are literally filled with such cars. They are not the exception but the rule. In these cities the wealthy classes have, previous to the war, been spending their winters in Europe. Not one winter or an occasional winter but every winter. Paris, London, Rome and Berlin were their Meccas. They spent 3, 4 and 5 months there. They had no ties binding them with New York, Boston, Chicago or our other leading cities. Our language was different from theirs. We had nothing in common. It was but natural that European automobiles and European cars only should find a market, and it was further natural that Argentina and Brazil should buy the

best that Europe had. Argentines had the money and the time. The luxurious car naturally was ideal for a people that take a peculiar delight in appearances and that find an added delight in satisfying this desire in Europe, which still is to all South America finality in art, in dress, in style, in manners and fashions.

After this lengthy digression in attempting to paint the picture of the European car in South America and the South American desire for it, let us revert to the U. S. A. car that for years rapped more or less determinedly at the trade doors of South America, but which has only in the last year or so found a responsive and growing market. In analyzing why the U. S. A. car is advancing in leaps and bounds in the last 12 months, bear in mind first of all, that it has started into a different field in South America than where the European car was sold. The U. S. A. car got its start in the country and that is where it is to-day selling in rapidly growing quantities. The European car sold very largely in the cities. The Argentine rarely thought of using it in the country.

The word country is rarely if ever heard in South America or Argentina. It is the *camp*. Camp not only means the country in which all kinds of grains are cultivated and large areas where cattle, sheep and horses are fed in the open, but includes the cities, towns and villages as well. Practically everything outside of Buenos Aires is camp. When a traveler goes for a selling trip he is said to be out in the camp.

U. S. A. Cars for Country Work

The U. S. A. car started selling in the camp and that is where it is selling most to-day. Our cars were not fashionable enough for the city. There the taste was for Renault, Benz, Rolls-Royce, DeDion, Mercedes, Fiat, Panhard, English Daimler and Napier. The opinion of the U. S. A. car was that it was not grand enough for the city and that it would not run in the camp. There were no roads there, and if there were the U. S. A. car was not robust enough, according to Argentine standards.

To Ford must largely go the honor of exploding this Argentine theory. The Ford car has accomplished it in the last 2 years. It required about 1 year of terrifically intense education and demonstration, and only 10 months ago did Fords start selling in quantities in Argentina, Chile, Uruguay and parts of Brazil, Rio not included. Previous to August, 1915, Fords were selling at approximately 100 per month total in Argentina and Uruguay. Suddenly they jumped to 300 and 375 per month, and since then this average has been maintained, and everywhere you find the dealer 2 to 3 months behind in delivery. Ford must get the honor of conquering the camp.

Dealers Want U. S. A. Cars

Two years and even 15 months ago the low and medium-priced U. S. A. car did not appeal to the Buenos Aires dealer who counts all Argentina an area as large as U. S. A. east of the Mississippi, and with 8,000,000 population, as his territory. Our automobile factory representatives traveled South America but often could not get an audience. They peddled their cars from agency to agency, and more often left without a representative than with one.

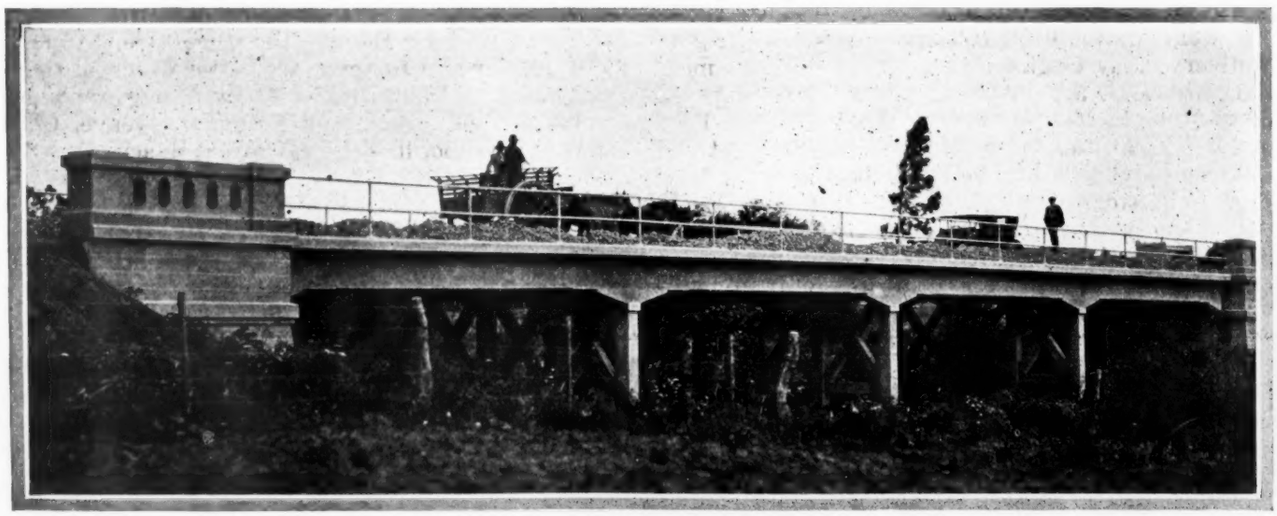
To-day it is all changed. Now the Buenos Aires, Montevideo and Sao Paulo dealers are after U. S. A. cars.

To-day our representative has the choice of five or six possible agencies. It is now a problem of selecting the most suitable, not a problem of discovery.

There never was a time when Argentine agents were more anxious for U. S. A. cars.

They are coming to the U. S. A. on nearly every steamer to look the field over carefully, visit the factories, inquire into the financial standing of the building companies and make a careful selection.

The Buenos Aires and Rio dealer does not like to make changes. He may be a little slow to tie up with a U. S. A. factory, but when he does, he hopes to make it permanent. He rarely changes. This is a characteristic of substantial South American business men.



Typical example of bridge construction on the government roads now being built across the country from Montevideo, the capitol on the south coast to the Brazilian boundry on the north

For the last 3 months there has been nothing short of a stampede in Buenos Aires for U. S. A. agencies. The same is true of Montevideo, Sao Paulo and such Argentine cities as Rosario, Cordoba, Bahia, Blanca and Mendoza, only to a much lesser degree. The same is also true in many smaller cities and larger towns scattered up and down the camp of Argentina. In every city visited during May and June, and there was nearly a score of them, the one inquiry was for U. S. A. agencies and information on U. S. A. factories and U. S. A. cars.

Many Agencies Placed

During those months agencies were placed for Maxwell in Buenos Aires and several other cities. The Dodge representative established his first agency in Buenos Aires, Montevideo and some other cities. The Chandler representative was making his preliminary plans. The Jeffery was placing agencies in Montevideo, Sao Paulo and other places.

Such makes as Ford, Cadillac, Overland, Studebaker, Hupmobile, Buick, Chalmers, Hudson, Oakland, and Scripps-Booth were already placed, some of them established years ago and others but a few months. Nearly all have taken on new life and are profiting by the stimulus given the U. S. A. car by intensive salesmanship. Ford and Studebaker are using the same well-organized sales systems as are being used in the U. S. A.

Naturally following in the wake of this newly found car business are some of our largest tire houses, several of which are taking prompt advantage of the inability of France, England, Germany and later Italy to supply tires. They are making unexpectedly rapid sales. In Buenos Aires the United States Tire Co. was just starting and its stock had not arrived. Goodyear has been under way for several months. Goodrich, the oldest, was established several years ago. Firestone and Fisk have been on the ground a short time but are doing well and several other smaller U. S. A. makes are being pushed.

Intensive Salesmanship Won

Dwell next for a moment on how this turn toward U. S. A. cars within the last 2 years was accomplished.

Virtually it was by the sweat of the brow. There was no royal road to success. It was not an order-taking program but an intensive salesmanship one.

Two handicaps had to be overcome:

1—There was the inherited dislike, if it may so be called, for U. S. A. cars.

2—There was a deeply founded belief that no car would prove satisfactory in the camp without improved roads and frequently without any kind of roads.

In making first sales in the camp the policy of one agent may be taken as a criterion. One of the most successful was a young Texan, O. P. Harris, who learned his lesson in salesmanship in U. S. A. He invaded the stronghold of the Argentine in the province of Pampa Central, one of more recent settlement and naturally a poorer field than the province of Buenos Aires, which is the oldest and best settled section of Argentina. He went to the camp with the Ford, the one he demonstrated with and sold. He called in the morning on the big land owner known as the Estanciero (E-stan-see-air-o). He did not get an audience. He was turned away. There was no use for U. S. A. cars. He was back before night, perhaps to be again turned down. He always came back. He got an audience. He got the Estanciero in his car. That was his aim.

Once seated in the car the sale was as good as made. Harris went everywhere on the huge farm or Estancia (Es-stan-see-ah). No trail was too rough. The demonstration lasted hours; sometimes 2, sometimes 3 and often 4 to 6. Harris took the wife of the estanciero and perhaps the children and another demonstration started. He had to prove his car and prove that the camp could be conquered as well by the car as it had been by the picturesque cowboy, gaucho (gow-cho) they call him in Argentina. It was now or never. Harris knew there was no second chance. He had to make good. He made good. His demonstration accomplished its object. He sold cars. He sold 125 in the one province in a few months.

So were the first seeds of the U. S. A. cars sown in the Argentine camp.

The Movement Grows Fast

Once started, the movement spread fast. One Estanciero told another. The car was a utility vehicle and not a part of social life as it had been in Buenos Aires.

One fact which greatly aided the introduction of the low and medium-priced U. S. A. cars in the Argentine camp was the high price of wheat and corn due to the war, and also to the great demand for Argentine beef, mutton and pork. The rising prices for these gave ready money to the Estanciero just as similar conditions caused unexpected streams of gold to flow into our own—Minnesota, Kansas, Dakotas and other wheat States. This ready surplus was freely invested in cheap cars, giving great impetus to a movement that otherwise might have struggled along much slower for several years. Success was crowded into a few months that might have needed years to achieve under ordinary circumstances.

Demand Is Spreading

It is argued to-day in Argentina that were it not for this situation the U. S. A. car might still be where it was before the war. Without disputing this part the fact remains that the U. S. A. car has sold, that it is selling and that there is a steadily growing demand among dealers for it.

This introduction of the U. S. A. car into the camp in Argentina, and we can similarly say into the camp of Uruguay and Chile and in such a rich State as Sao Paulo, in Brazil, is doubly interesting to U. S. A. makers when still further handicaps under which it was introduced are studied. There are several of these:

1. The price of gasoline in Argentine has constantly risen since the war. Previous to the war, England was the great supplier of gasoline, naphtha

as it is called in South America. To-day U. S. A. supplies practically all the gasoline. But the rise in price has been due to the same causes that have been active in North America, namely, scarcity of crude and tremendous demands for gasoline from Europe.

Fuel at 70 Cents a Gallon

But you must add to this the enormous increase in ocean freight between New York and Buenos Aires or Rio or Montevideo. Nearly all gasoline going to South America goes in sq. 5-gal. cans. Two 5-gal. cans are crated together and form a case. Before the war freight amounted to 20 cents a case, it rose as high as $1.70, an eight-fold increase, and the average rise was $1.20, or six times the normal rate. To-day gasoline sells as high as 70 cents in U. S. gold per gallon, in many places in the camp where U. S. A. cars are selling in quantities. In several cities the price is sufficiently high to compel quite a few owners of high-priced cars to store them in garages.

In spite of this handicap the U. S. A. car got its start and is selling in surprising quantities.

2. Perhaps a greater handicap of the selling of U. S. A. cars to-day is the question of freight. For some months freight has been $1 per cu. ft. between New York and Buenos Aires or Rio. It was as low as 20 to 35 cents. Last August the freight rise started and kept steadily on until May 1 when the apex was reached. To-day it is easier. Because of the freight rise, prices of U. S. A. cars in many cases were raised all through South America. On May 1 Ford prices went up from $1,750 up to $2,050, Argentine dollars or pesos (pay-sos). Many other increases were on a like scale, but this did not stop selling, although it did not come in the Argentine selling season.

3. A third handicap to the selling of U. S. A. cars is the unfavorable exchange rates between Buenos Aires and Rio and New York. Exchange is a problem little known of in much of our home automobile business, but is on the lips of everyone in South America. One automobile business man in Sao Paulo, Brazil, told me of losing $150 U. S. gold on one payment he made in New York on cars. The rate of exchange was unfavorable on that day. He had waited several days for it to improve, but it went from bad to worse.

Gasoline, Freight and Exchange

Gasoline, freight and exchange are the three great factors making it hard to sell U. S. A. cars in South America.

But if it has been a task to sell U. S. A. cars in Argentina, Uruguay and Brazil it has been impossible to sell, too, the expensive European cars. They stopped selling in 1911 when the financial crisis arrived. You see to-day salesrooms filled with the same cars they had in 1911. You ask a dealer how many cars he has sold since the war started and he answers not a single one. Some have not sold one for 3 years, and a few for 4 years, in other words, since the crisis of 1911 there are a score of dealers filled up with old European models.

You ask how can these dealers stand the financial strain of not selling a car for 4 years and having a showroom filled with them. The answer is brief: Those who were exclusively dealers and sold cars only did not stand it—they went broke. But there were few exclusive car dealers. The majority of dealers were large machinery houses with whom automobiles were a side line. They sold farm machinery, electric machines, hydraulic machinery and machinery of all kinds. Thus not having all their eggs in one basket, they withstood the crisis and are still able to carry the automobiles.

It was these large houses who 2, 3 and 4 years ago would not get interested in a U. S. A. car. They had a deaf ear for all U. S. A. car representatives who went to Buenos Aires and Rio, Montevideo and Sao Paulo for agents. They had had enough of selling automobiles. They had overbought and were caught. We could not interest them in U. S. A. cars.

Within the last 18 months these business houses have seen 2 or 3 makes of U. S. A. cars start selling in the camp. They see chances of coming back into the automobile industry. They see attractive chances of making more money out of U. S. A. cars than perhaps they ever made out of European cars.

Here is the keynote together with other numerous reasons that there is to-day a great and growing demand for U. S. A. cars and accessories in Argentine, Brazil, Uruguay, Chile and perhaps all west coast cities as well.

Why a Throttle Lever?

FIVE years ago there were many cars still being built without an accelerator pedal, and the latter, when put on, was an addition to the hand control and not a substitute. In Europe at the same period many cars had accelerator pedals only and no hand throttle whatever. Actually there is no need for both because the driver invariably uses the pedal when it is provided and the function of the hand throttle lever is simply to set the throttle in the proper place for idling or starting.

An accelerator pedal alone, without any hand control has the drawback that the proper throttle position for the slowest idling varies from day to day owing to the temperature and other variations. This means that some adjustment is needed which will alter the exact point to which the pedal returns when the foot is taken off it. Now, it is easy to provide a dashboard lever which will perform this feat without anything like the same number of parts required to connect a lever above the steering wheel with the carbureter.

Furthermore, controls passing down the inside of the steering post are always liable to rattle, and it would be easier as well as a little cheaper to make steering gears with only one internal control tube. The clearance could be doubled and the chances of rattle reduced in proportion. There is also no doubt that a single lever above the wheel looks much neater than the conventional double quadrant. There seems good reason to think that if some prominent manufacturer would make the move the industry would be quick to abandon the old-style throttle lever.

No doubt many of the old-time drivers who were used to the hand throttle before the days of the accelerator will disagree with this view, they still use the hand control or think that they do. Let it be remembered, however, that these men are but a very few among a vast multitude, and the newer motorist makes practically no use at all of the hand throttle lever.

Less Weight and More Power for New Franklin

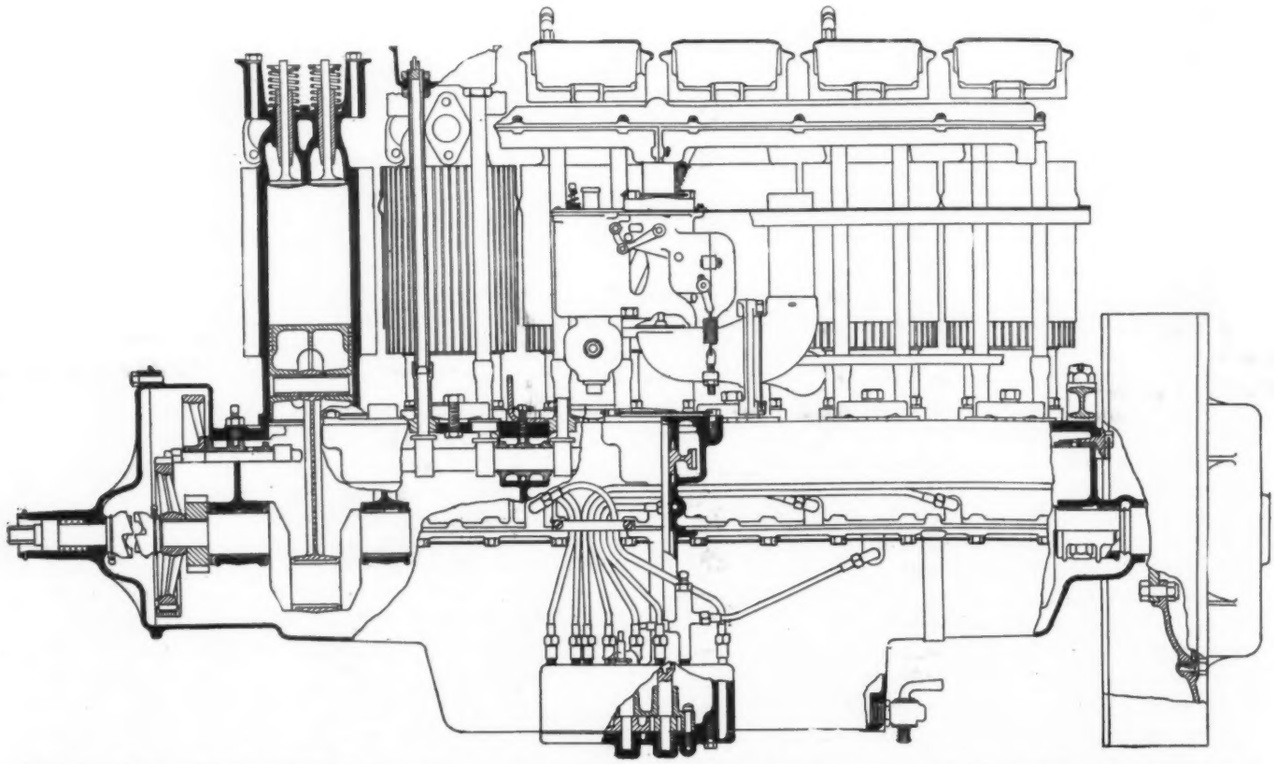
Has Smaller Engine of Higher Hp.—Weight Just Over 1 Ton—Appearance Improved—Price Reduced to $1,850

THAT the H. H. Franklin Mfg. Co., Syracuse, N. Y., had a new model in preparation was known to a few over a year ago, which means that the chassis now announced has had a very great amount of work put into it and has been tested with especial thoroughness. The results of this careful preparation are quite remarkable, for the new car is a very considerable advance on previous Franklins, good though the latter undoubtedly were.

400 Pounds Saved

The 1916 Franklin has been generally accepted as the lightest comfortable touring car of its capacity in the world, this low weight being obtained by scientific design, careful choice of material and elimination of every superfluous pound of metal. That as much as 400 lb. could be trimmed off it without depreciating performance or comfort was a surprise even to the Franklin engineers, but this has been done and both performance and comfort are improved thereby. This large amount of weight has been saved without making the car smaller. The new engine in lighter, being a trifle smaller in the bore, the gearset has had several pounds cut out and both axles are lighter. All the petty details have been examined with a microscope, so to speak, and ounces cut here and there; more forgings and fewer castings are used and aluminum takes a bigger part than ever.

The general lines of the chassis remain almost unchanged. The air-cooled engine, now 3¼ by 4 in., is externally similar to the old 3⅝ by 4 in.; the wood frame, full elliptic springs front and rear, and the amidships gearset are all retained, in fact, it needs a close examination of the chassis to find the changes. Externally the finished car has been improved in appearance very greatly. The sloping hood has had rounded corners substituted for the square ones, and it is wider, making a flush joint with the cowl all the way around. The bodies have also been rendered smoother and every one in the whole range of types is as good looking as another, the closed styles being, perhaps, especially distinctive. Also a new design of four-passenger roadster, which is not a clover leaf, is likely to prove popular, as it has all the close-coupled effect and is much easier to enter. There are divided front seats and a back seat in just the same relationship as in a clover leaf, but the doors are almost double as wide as usual. When open the door allows entrance to be made to either front or rear seat. Still easier entrance to the rear seat can be had if desired, by tipping the front seats, both of which are hinged so as to fold forward.



Section of the new Franklin air-cooled engine 3¼ in. by 4 in. This is on much the same lines as the former type but is a little smaller, though producing slightly more power. Atwater Kent ignition has been substituted for the magneto and the use of a Stewart vacuum feed allows the carbureter to be placed higher

The sedan and brougham bodies have been altered by the substitution of a V-fronted windshield for the flat pattern and the lines of sides, front and roof have been blended in a particularly happy way. It is not too much to say that the whole closed car range resembles the best class of custom bodywork. Great care is taken with the detail finish of all the bodies, and one noticeable point is the solid way the doors close; in fact, the bodies all give the impression of weight and massiveness; it needs an examination of the unfinished shell to realize how very opposed to the truth this impression is actually, for they are light as well as strong.

The principal car of the Franklin series is, of course, the five-passenger touring job, which sells for $1,850. The four-passenger roadster costs $1,850 also, and there is a two-passenger roadster at $1,000, this having a very big boot under the rear deck which would hold enough baggage for a 3 months' tour. The sedan costs $2,750 and the brougham, which is merely a smaller sedan, $2,700. In addition to these cars, there is a limousine for $3,000 and a very smart town car at the same price, while the eighth model is a cabriolet selling at $2,650.

Franklin expects to make 10,000 cars in the next 12 months, of which about 7000 will be the touring car and 1000 roadsters for two or four passengers. Of the sedan 1000 will be made and the other closed types will complete the schedule. It is thought probable, however, that the demand for the four-passenger roadster will exceed this estimate, judging by the orders now being placed by dealers.

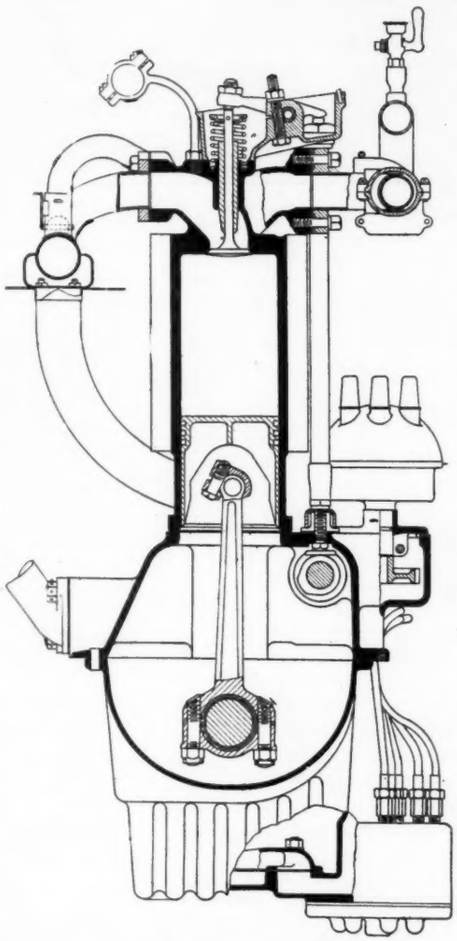
Engine Not High-Speed Type

Although it produces its maximum of 31 hp. at a higher speed than the maximum of the older motor the new engine is hardly a high speed design, the peak of the power curve coming at about 1700 r.p.m. The maximum torque is 112 lb. and occurs at a little over 1000 r.p.m. It is a small engine, the 3¼ by 4 in. dimensions for the six cylinders, making the total piston displacement 199 cu. in. and the formula horsepower is 25.3. On high the gearing is 3.9 to 1, the wheels being 32 in., which means 1950 revolutions of the engine per mile, or a total displacement of just under 390,000 cu. in. per mile. Since the weight is under 2300 lb., this gives a large ability, which is evidenced on the road by rapid acceleration on high. The maximum speed of the car is 50 m.p.h. or over. That is to say, 50 m.p.h. is reached easily and more under favorable conditions.

The engine is 150 lb. lighter than the old power plant, but, apart from the reduction in bore, it is little changed. The air-cooling system is exactly as before, save that the flywheel with its multiple blade lower construction is now an iron casting instead of being built up. Vertical steel fins are made integral with the individual cylinder castings by having the iron poured around the strips of steel and very light aluminum jackets guide the air draught downward from the heads of the cylinders.

The overhead valve mechanism has been lightened in detail, so that there is less inertia in the operating parts and the point of contact with the rocker on the valve is so shaped that the action of the rocker cannot put any side stress on the valve stem, so causing wear on the guide.

The most marked change in the engine is the substitution of Atwater Kent ignition for the magneto. The Franklin engineers consider that this battery system gives better results at low speeds and equal results at high rates of revolution, while it is again an opportunity for saving weight. For control of the ignition point the Atwater Kent automatic advance is used, there being no spark lever on the steering wheel. Lighting and starting are performed by a Dyneto single unit machine driven by silent chain and located at the front right end of the engine; it is very accessible and the wiring is also simplified to the last degree. All the important junctions, fuses, etc., are carried on a panel in the cowl board and the spare bulbs for the lamps are also held in sockets on the same panel, so that they are perfectly protected and always accessible in a hurry. The carbureter is the standard Franklin design, with which the various economy runs have been made. It has been raised considerably and now has a Stewart vacuum feed from a rear tank.



Cross section of the Franklin engine

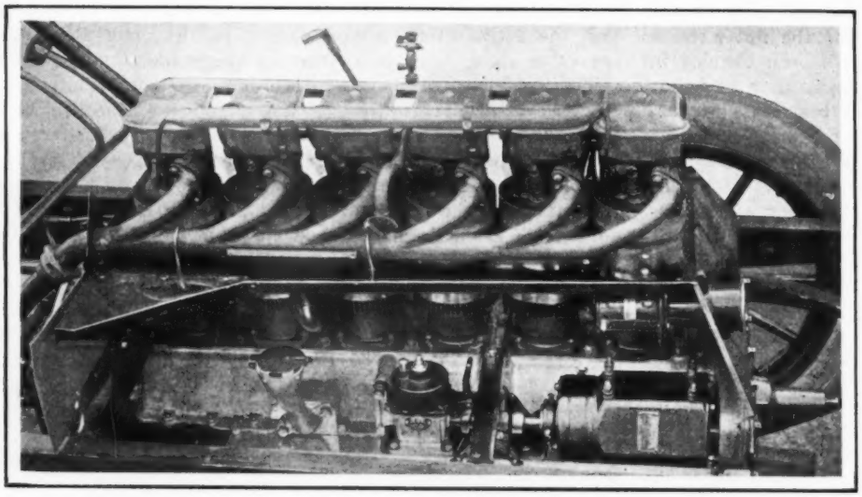
Incidentally, it is stated by the manufacturers that the new model with its reduced weight will be able easily to break all previous economy records, and that the average man using the car in the average way without taking any special care for economy ought to get well over 20 miles per gallon. This, of course, being a minimum and not a maximum. In other words, the economy is improved in the same proportion as the weight is decreased.

New Aluminum Piston Type

Seeing that the normal working temperature in the Franklin engine is distinctly high, the makers were not very ready to believe in the aluminum piston, but they have now adopted it as stock practice and consider that the better mean effective pressure of the new engine is largely due to the improved piston cooling obtained. At first there was a little trouble from wear on the skirt; it was difficult to get a close enough fit to insure absence of slap without abrasion. The trouble was overcome completely by turning a shallow, square groove of screw thread form from the bottom of the skirt to just beneath the lower ring. This holds oil securely and allows a smaller clearance than is possible with a plain piston.

There is an interesting lubrication system employed, individual oil supply being sent to every point. The oil pump, which is a conventional gear pattern, is mounted on a large plate, and the delivery from the pump is distributed to a number of oil leads by means of passages in the plate. Actually the plate is die-cast aluminum with distributing grooves, and these grooves are made into closed passages by putting a piece of thin sheet copper over the face. This gives direct pressure feed to all bearings on the crankshaft and to various other points.

Bearings, and details on the underpart of the engine are now more accessible because the boot or under cover has



Franklin engine, showing mounting of motor-generator, tire pump and horn

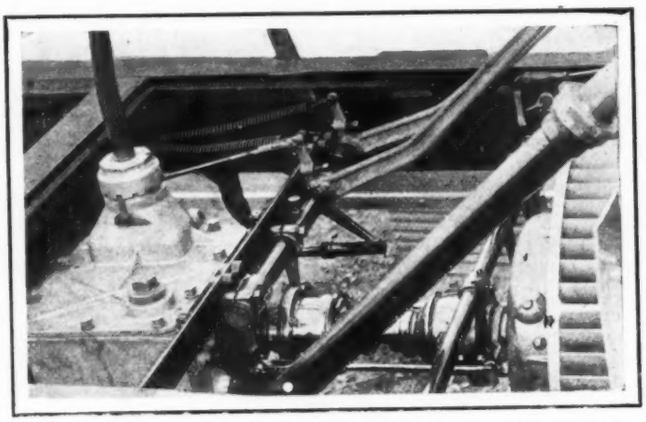
been abandoned, the sides of the crankcase being now joined to the frame sills by sheet aluminum guards, leaving the bottom of the crankcase exposed. The elimination of the under cover also aids in reducing the weight.

Gear-Shaft Location Changed

The previous Franklin gearset appeared remarkably light, but the new design is still lighter. Instead of being side by side the shafts are now one above the other and the square shaft has been replaced by a splined one. Three speeds are provided and it is noteworthy that the second gear is very quiet in operation, probably owing to the stiffness caused by the short shafts and very compact case. The gear shift lever is housed on the top of the case, working in an adjustable ball joint; it is a tube with solid ends brazed in, thus being very light though stiff. The emergency brake lever has been removed from its central position and is now on the frame at the driver's left, where it lies well forward and out of the way. It does not obstruct the entrance from the driver's side, and its absence from the middle position makes more foot room. There is no intermediate linkage for this brake, as the pull rod goes direct from the lever to the rear axle. The clutch is unchanged, and the foot brake is still on the back of the gearbox, operating with great power and smoothness.

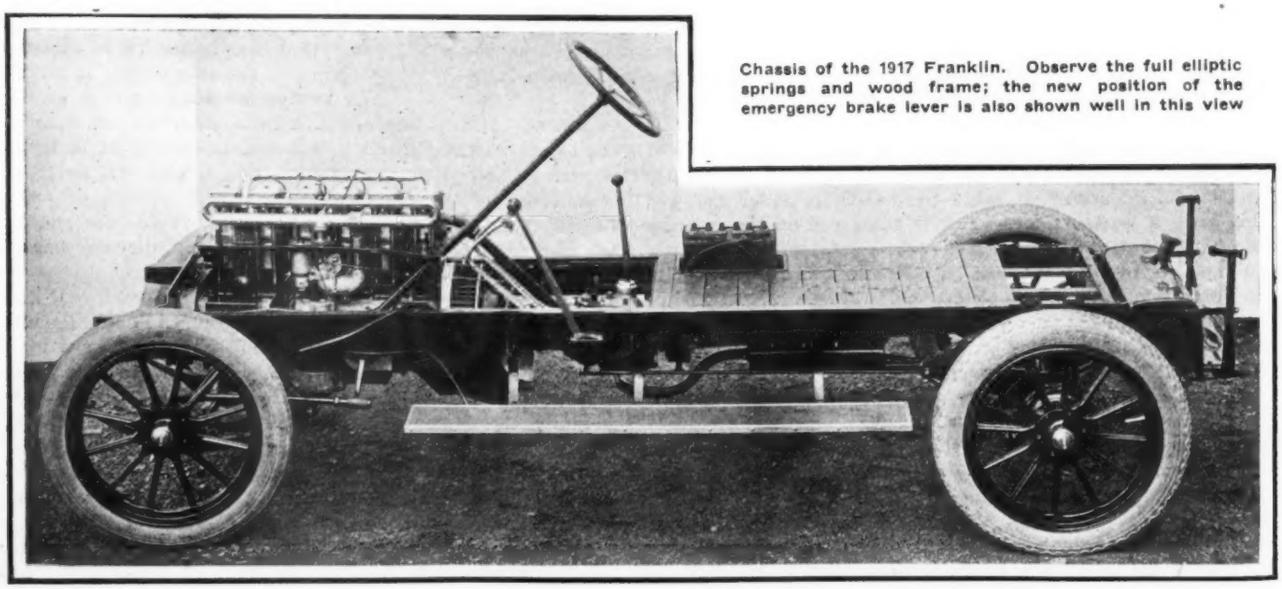
Despite the smaller weight and also despite the fact that the springs are shorter, the new car rides much better than the last series. A really rough railroad crossing can be taken at 20 m.p.h. without shaking a passenger off the seat. The explanation of this is in the axles, whence a large amount of weight has been taken. From the rear axle 25 per cent of its original weight has been removed, and from the front axle 30 per cent. This is due to the use of finer forgings and the elimination of some redundant parts.

Another effect of the small weight is to make the car so easy to steer that the first impression on taking the wheel is that something has come undone. The effort required to move the wheel is so slight that a child could steer the car easily, and a woman could drive all day without tiring her arms. There are no cars made anywhere in the world that steer more easily and extremely few that are as light to handle. The facility of control extends to the clutch, brakes and gearshift, all of which move without effort.

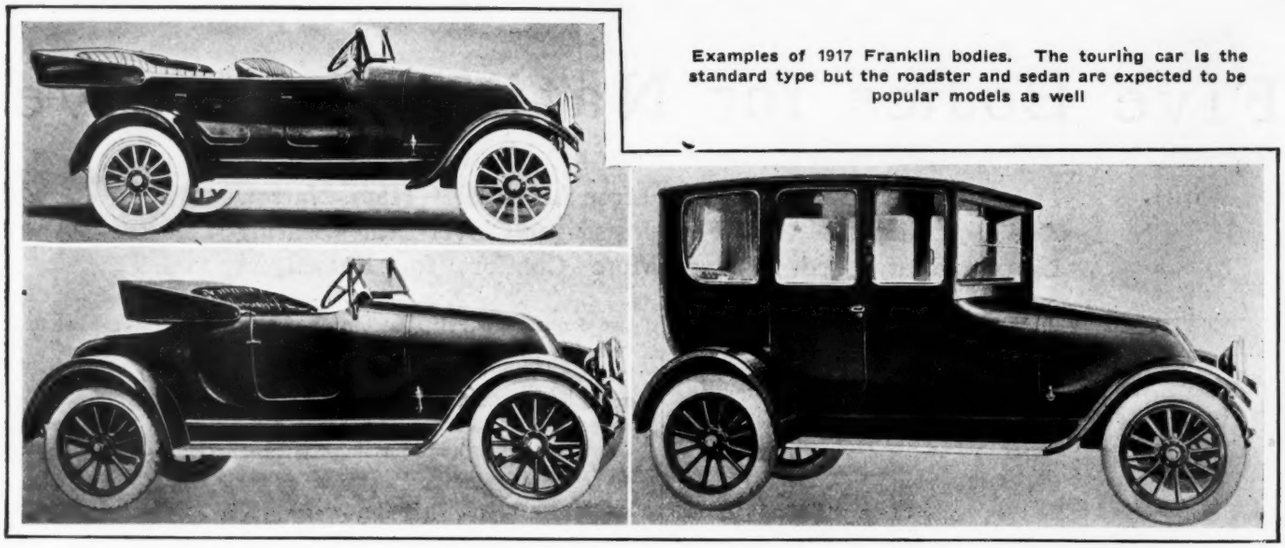


Centrally placed gearbox on Franklin showing the pedal assembly

There is no need to itemize the fittings. All the customary



Chassis of the 1917 Franklin. Observe the full elliptic springs and wood frame; the new position of the emergency brake lever is also shown well in this view



Examples of 1917 Franklin bodies. The touring car is the standard type but the roadster and sedan are expected to be popular models as well

equipment is given, and all of it is of good quality in keeping with the character of the car.

In regard to equipment, the cowlboard has been well arranged, the clock and speedometer both being under the driver's eye, while the carbureter control and the switches are ready to his right hand. The horn button is mounted on the side of the door, where it can be operated either by the hand, or by side pressure of the knee, and a complete tool kit is contained within the upholstery of the door, each tool being in a special clip. The compartment has a lock.

A single tire carrier is built in conjunction with the gasoline tank brackets, and provision has been made for attaching luggage at the front of the left running board. Strap loops are mounted to retain the straps which secure trunks or other luggage, and on the inner edge of the running board stops are properly placed to hold the trunk in position. The luggage space accommodates a two-suit-case trunk, 10 in. high and 15 in. wide, and 30 in. long. Tires on the open cars are 32 by 4 in. and 32 by 4½ for the closed models, to allow for the different body weights.

Shortcomings of the Conventional Lifting Jack

WHEN it is necessary to raise a wheel off the ground to change a tire the inadequacy of the conventional form of tool used for the purpose becomes apparent. Lifting jacks as a rule are ingenious and so far as the actual lifting gear is concerned there is no criticism to offer. It is, though, rather remarkable that no automobile manufacturer has yet seen fit to provide any definite place on the axle where the head of the jack will take a firm, square seat.

No Firm Contact Point

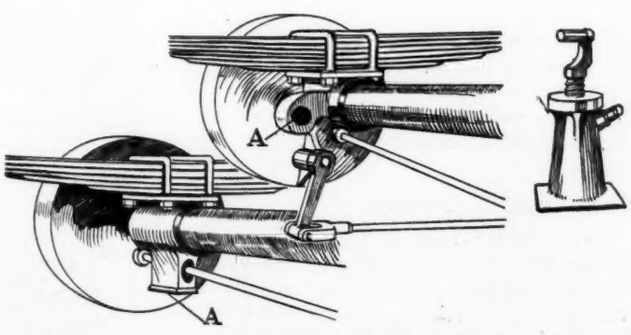
On the rear axle it is sometimes positively difficult to find a place near the end where the head of the jack will go at all, because of the various protuberances on the brake bracket and because of the tie rod stay. Thus the car is often none too secure and stable when resting on the jack.

When it is a front wheel in question there is certainly a place to put the jack, but one generally finds that the jack has to be set much lower to go under the front axle than it needs to be at the rear, which means that the jack cannot be kept in the kit so set that it is ready to lift either front or rear axle with the minimum of strokes and in the minimum of time.

A Special Bracket Possible

It would cost nothing and would be quite easy to have some special place on one of the brackets at each end of the rear axle designed to give a firm contact for the jack. All that is needed is a downwardly projecting lump of metal which would clear the tie rod and all other projecting parts. The sketch, Fig. 1, shows this idea. It would be easy also to have the distance from the jack abutment on the rear axle to the ground the same as from the underside of the front axle to the ground, so that the same setting of the jack would suffice for either axle.

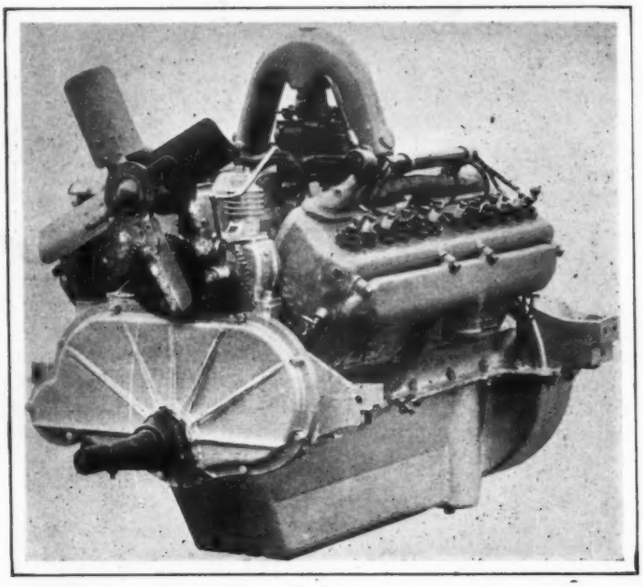
Carrying the idea a stage further, instead of a flat abutment on the axle there might be a lug with a hole through it, as sketched in Fig. 2. The jack would then need a special form of head which would hook into the hole in the lug. This would mean a special jack for all axles of the same make, but it would provide perfect security. A car could not fall off such a jack as long as the base of the jack rested upon firm ground. The second suggestion was made by a correspondent in *The Autocar* (England) as long ago as 1913, but the idea never found any supporter among British manufacturers. It seems difficult to understand why something of the sort could not be done as the convenience would be very real. Every car has to have its tires changed many times during its life, so why not make the job as easy as possible?



Left—Fig. 1—Suggested provision for jack contact. Above—Fig. 2—Fitting for special jack shown at right

Five Bodies for National Twelve

Detail Refinements Make Car More Accessible—High, Narrow Radiator Adopted—New Four-Passenger Clover-Leaf—Seating Layout Rearranged, Giving More Comfort for Passengers



National twelve engine, showing outside arrangement of the valves. High-tension magneto ignition is a feature

A NEW series of National Highway twelve-cylinder car is just going through production in the Indianapolis factory and incorporates several changes over the model marketed last season. This is a companion car to the National Highway six which is being continued. Following the general trend, prices are higher this year on the twelve-cylinder model than last, the increase being $130 per car, making the price now $2,150. This includes extra seats, however, while last year these seats were sold at $30 extra.

A number of detail improvements have been made throughout the entire car. In the first place the touring body has been increased in size and now instead of being a six-passenger job, it has a full seven-passenger capacity. Although the improvements are numerous, for 1917 the same general chassis layout on the 128-in. wheelbase will be adhered to. Instead of an option of 34 by 4½ or 36 by 4½ tire, the regular equipment will be 34 by 4½ which was the choice of the majority of buyers during the last season.

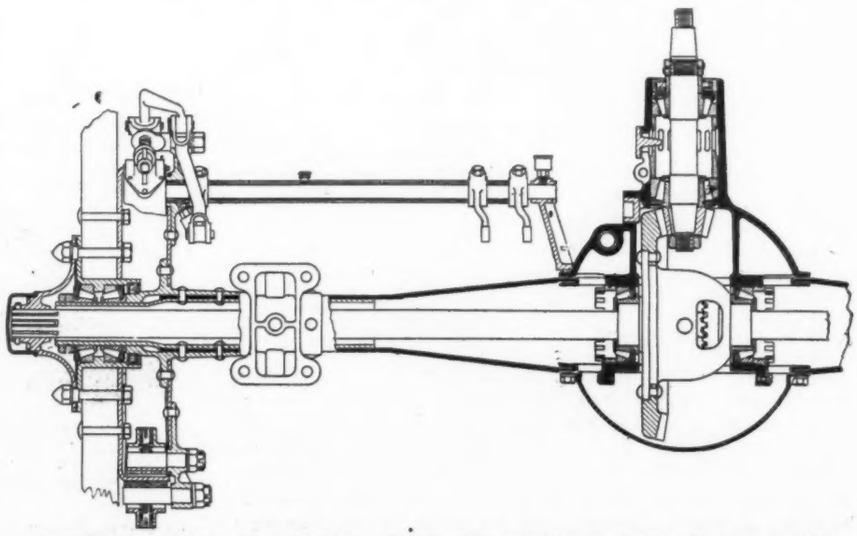
Many Detail Improvements

Probably the most notable change on the new National Highway twelve-cylinder car is in the seven-passenger touring body design. Although the chassis is the same length, the new body is 3 in. longer. It has a center cowl and there is an aisle between the two front seats. In the tonneau under the center cowl are two locked package compartments. The front seats are larger in every dimension and there is also more room in the driver's compartment. The body is wider than in the former series and there is more carrying capacity under each of the three seats. In addition there is a tool compartment in the left front door as on the former models.

Five Body Styles on Twelve

The new Highway twelve cars are furnished in five different body styles. In addition to the seven-passenger touring car there are a four-passenger touring car, four-passenger roadster, five-passenger all-weather sedan of the Springfield type and a three-passenger coupé. In the open models there is a new design of side curtains and these are fitted to the doors and so arranged as to permit the curtains to open with the doors, thus giving a closed car effect which is very useful in rainy weather.

The arrangement of the extra seats has been carefully worked out so that the tonneau floor is smooth and the folding seats and their supports are fitted flush with the floor when the seats are folded. A new and specially designed tire holder in the rear has the advantageous feature of requiring but one strap and provision is also made that the spare tires can be locked if so desired. Another feature of convenience is that the gasoline tank filler has been moved over to the right side near the right fender. It is now provided with a hinged cover which is held in place with a wing nut. This gasoline tank cover cap is easier to open than the old one and by being hinged it is impossible to loose it. A change which alters the appearance of the car somewhat from the older model National is that the radiator has been altered so that it is now 2 in. narrower and 2 in. higher than before. This gives a proportionately higher hood and has necessitated somewhat the change of the customary National



National floating rear axle in section. Taper roller bearings are used. The axle is light but strong

radiator emblem, as far as size goes. The shield design, however, is still maintained in spite of the change in size.

A study of the exterior of the car will reveal some other minor differences which may be particularly noticed in the fenders which are an inch wider and of new design in the rear and also the slanting windshield, the straight side of body instead of the tumble-home type formerly used, the flush doors and the necessary alteration in general lines to coincide with these changes. In equipment also a few alterations have been made, particularly on the dash, where a new oil pressure gage with a unique dial design has been installed and also a new combination ignition and light switch which is locked by a special key. The keys for these locks are not interchangeable.

Four-Passenger Clover-leaf

The clover-leaf design which was marketed last year as a three-passenger body has now been made into a full four-passenger job. This has been accomplished by increasing the body all around and by moving the rear seat back 4 in. The back of the rear seat is higher, making it fully as comfortable as the front seats.

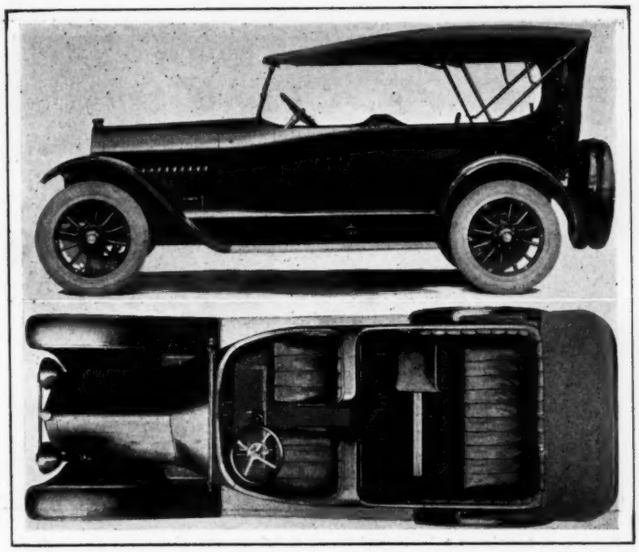
Outside Valves for Accessibility

The National Highway twelve motor is a product of the National company's own shop. It has a piston displacement of 338.5 cu. in. and a bore and stroke of 2.75 by 4.75 in. It is a high-speed type throughout and is particularly distinguished by the use of outside valves which make it very accessible. The electrical apparatus and other motor accessories are located between the arms of the V where they can be easily reached.

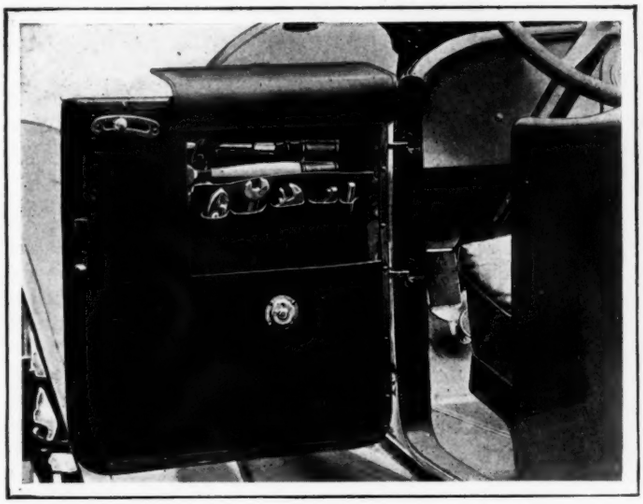
Two separate blocks of six cylinders each are used, both L-head type and with two independent camshafts. No effort has been necessary to install synchronizing means for the two valve actions as they are altogether independent. The timing gearset is quite similar to that used on the ordinary T-head motor, and the drive for the auxiliary apparatus in the center of the V is taken off the right camshaft by a silent chain.

Pressure Oiling System

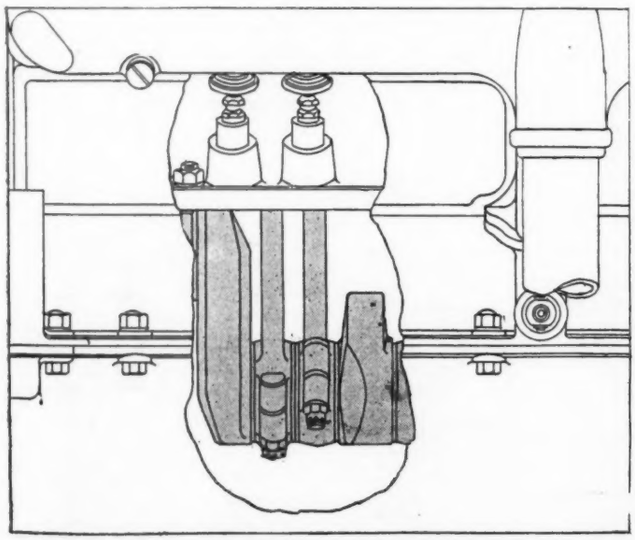
In working out the lubricating system the feed is practically all under pressure and is regulated by the output of the gear pump which is located in the oil base having a large screen on the suction side and also a gauze strainer in the form of a tray covering the whole top of the oil pan, but there are no dip troughs as the crankshaft is fully drilled and



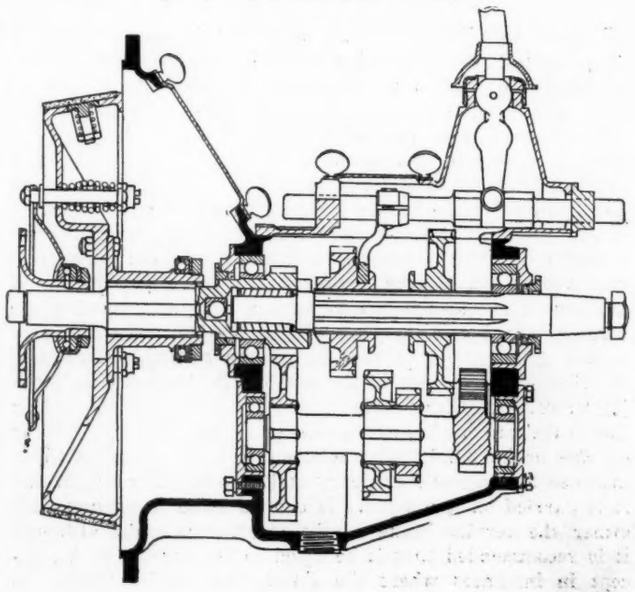
New National Highway twelve-cylinder seven-passenger touring car, selling for $1,750, showing the new seating arrangement

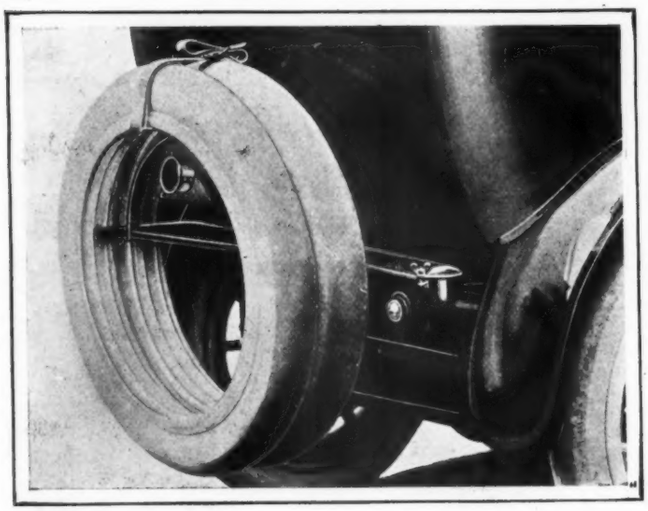


All tools for the National twelve-cylinder cars are conveniently carried in the locked compartment of the front door on the driver's side



National twelve side-by-side connecting-rod mounting and section through the three-speed gearbox used on this car





New tire carrier on National twelve, which requires but one strap as the holder fits firmly inside the demountable rim. Note gasoline tank filler and gage

the oil from the main bearings finds its way to the connecting-rod lower ends.

Oiling the Wristpins

Separate pipes lead to the timing gears and to each of the camshaft bearings while the piston pins are oiled by an inversion of the usual method of fully forced lubrication systems. As a rule the connecting-rod serves to carry the oil to the wristpins and then to the cylinders, but here the oil feeds to each cylinder at a point about 1½ in. from the bottom and reaches the wristpins through tiny holes drilled in the aluminum pistons. The latter have a V groove cut near the bottom, which is used to lift oil into the cylinder, as the absence of splash troughs in the body of the crankcase cuts down the amount of spray present. As to the oil pressure, this is not very high, the relief valve blowing off at 25 lb. per square inch. When the engine is idling the pressure is about 10 lb., and it rises gradually with the engine speed.

There is only one water pump, but this is duplex internally, the rotating member carrying two sets of vanes. One set feeds directly upward into the block of cylinders on the right and the other half of the pump delivers through a passage cast in the aluminum of the crankcase to the left block. This cuts down the piping materially and makes for efficiency and simplicity.

A few other facts about the engine that are interesting may be given, as, for instance, the weight of the piston, which is 8 oz. without rings. The valves are 1 5/16 in. diameter and the left is ⅜, giving a quite large opening, while the mushroom tappet provides a quick lift and descent, giving a slightly better valve diagram than the roller type. It is probable that the fan has some effect as a damper to the crankshaft, though it is doubtful whether any such aid to elimination of vibration is needed, but the short belt drive, when kept tight, provides a flywheel just as the Lanchester device, with a slipping possibility. Of course reaction from the fan would be cushioned a good deal by the belt and then the chain, but it is an undoubted fact that the presence of a fairly high speed fan does often have a steadying effect on an engine.

Flat Cantilever Rear Suspension

The clutch is an aluminum cone with leather face and the unit gearset provides three forward speeds, all shafts therein running on annular ball bearings. The propeller shaft is tubular and bears two universals, and the rear axle is floating. A flat cantilever rear suspension is employed and it may be noticed that the center bracket has the swivel pin located beneath the spring instead of above it, as is more usual. The springs are 51 in. long and 2½ in. wide with eight leaves each and their action is extremely satisfactory. The front springs have no noteworthy peculiarity, being 38 in. long by 2 in. wide, but special precautions have been taken in laying out the steering and the use of large ball thrust bearings for the front axle swivels makes the steering control very powerful.

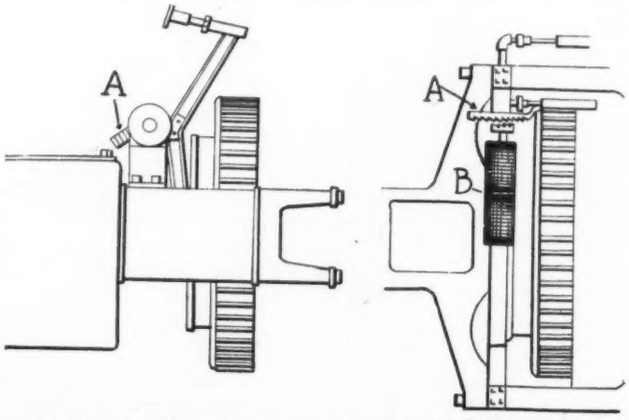
Superfluous Weight Eliminated

Throughout the rear axle taper roller bearings are used, and the type is floating, very strong steels being used so as to cut the weight as much as possible. This statement applies to the whole chassis which has few redundant parts and very little dead weight in any portion. Drive is by spiral bevel and the direct gear ratio is 4.4 to 1.

An Electro-Magnetic Lock for Brakes

LEON GOLDMERSTEIN, who will be remembered as having recently read a paper on aeroplanes before the Metropolitan Section of the S. A. E., has entered the accessory field with a novel form of automobile lock which prevents motion of the car by holding the brakes in position. The inventor points out that this will not only prevent the car from being stolen, but will prevent it from rolling down hill after the brakes have been applied and locked.

The device is electro-magnetic in operation, consisting essentially of a commutator switch and a solenoid which carries a bolt and locking device at the end. Application of the switch causes the coil to become energized, moving the core backward and carrying with it the bolt. By means of a slot arrangement in the cap of the solenoid which acts in relation to a groove in the core the device has been made jolt-proof. Another provision which has been made is that the brake can be locked regardless of the amount of wear on the brake band. The solenoid is made armor clad to increase its magnetic efficiency and mechanical strength and it is carried on a bracket. It can be made to engage with either the service brake or the emergency brake although it is recommended that it be fitted to the service brake, except in instances where the clutch and service brake are combined. A possible layout is illustrated, the pedal having a ratchet A attached to the lever. The solenoid is shown at B and when energized the ratchet seen on the end of the solenoid core is brought into engagement with the ratchet A, thus holding the brake so that the pedal cannot return.



Possible layout of the Goldmerstein electro-magnetic brake lock

The History of the Pneumatic Tire—12

Pneumatics Which, When Deflated, Served as Solids Tried Out and Found Impracticable—Inclosed Types—Origin of the Tire-Filling Business—Palmer's Early Work

The History of the American Automobile Industry—39

By David Beecroft

ATTEMPTS to devise a practical pneumatic tire, which, when deflated, served as a solid met with two difficulties. Sometimes the excess material caused by the deflation slipped on the base and sometimes it folded in ridges, but both were equally destructive. A short run would damage the tire beyond repair. The attractiveness of the idea seemed to warrant a large market if the device could be made successful, and it is certain that this can be done if the supporting surfaces which carry the load when deflated, are quite large and are lubricated, so that slipping between the tread and the base portions can take place without wearing them or without straining the sides of the tire casing. Some recent patents to Duryea show such a construction, although not yet on the market.

Other Less Practical Forms

Other still less practical forms of tires aimed to avoid punctures were brought out in 1892. A Chicago man advanced an idea, since frequently proposed, of inclosing the air tube inside the steel rim and providing a tire of solid rubber between the edges of the rim resting on the air tube, which rubber could yield and compress the air tube but would be so thick as to be unpuncturable. The little matter of friction, which would quickly ruin the solid rubber, was overlooked.

The Tire-Filling Business

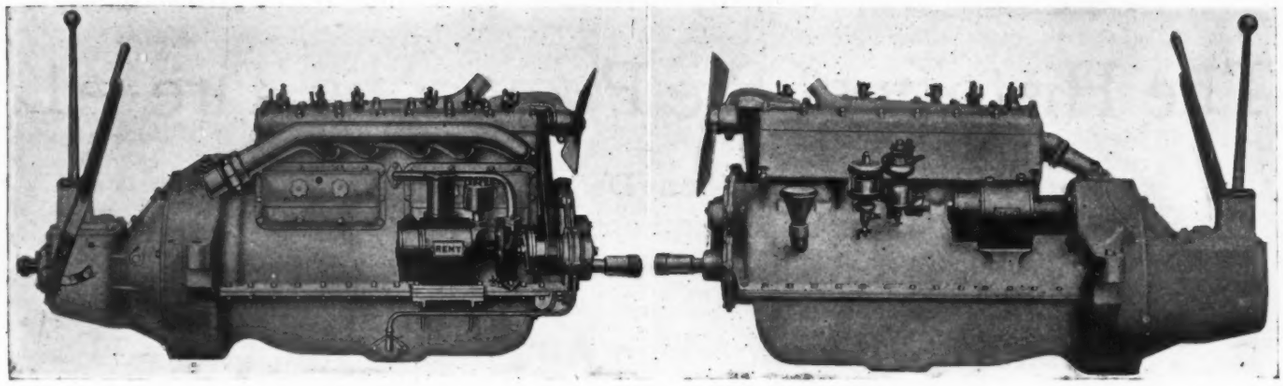
Another idea which has frequently come up since was patented by Sweeting in 1892, who proposed to fill the tire with water or with sponge afterwards soaked with water and thereby considerably expanded. It is a fact that a liquid will not flow through a puncture which permits air to escape readily and the thicker the liquid the larger this puncture may be, and yet the tire remain usable. This idea finally grew into a considerable business, the tires being filled with a sort of rubber imitation made under various formulas; some of these used the glue and molasses or glue and glycerine combinations of the printer's rollers while others used rubber compounds. In all cases, they were heavier and less resilient and therefore less valuable than the air tire and so have not found great favor. The water tire particularly failed because of its considerable weight and because it rendered the bicycle slow. Owen, some years later, suggested air chambers inside the rim which would serve as cushions and thus give a sort of elasticity to the incompressible water and perhaps overcome some of its disadvantages, but this device was never marketed.

Spring Tires in 1892

The spring tire again occurs in 1892, being shown by Whiting on a bicycle with two rims, one inside the other, and connected by radial, helical springs. The outer rim carried a solid rubber tire. Any arrangement of this kind requires that the bottom springs be strong enough to carry the whole load, and since the wheel turns, the total weight and strength of springs required is all out of proportion to the results. In spite of this, however, many attempts were made to develop a practical construction of this sort.

Palmer's Self-Healing Tire

Beginning about 1891, John F. Palmer began a development which grew into considerable importance in the next few years, although in a widely different line from that in which it began. As first shown, he had a valveless, pneumatic tire which could be inflated by inserting a hollow needle anywhere in the tread portion and which would seal the puncture just as the lump of unvulcanized gum inside the toy ball serves as a valve. Palmer's self-healing tire was more widely accepted than any of the other forms except the healing liquid and was made by vulcanizing a tube of fabric and rubber with the rubber on the outside followed by turning it inside out and splicing the ends. This put the rubber under a considerable compression and a puncture would be closed by the natural action of the rubber. Further, rubber looses its elasticity to a considerable extent if permanently held and so this original tendency to close an opening gradually disappeared and the tube ceased to be self-healing. Palmer's activities went into the thread tire, which was found to be considerably faster than the more common canvas ones and from which the modern cord tire has been developed.



Both sides of the unit power plant used in the 1917 Madison cars. The engine has a bore of 3⅛ and a stroke of 5 in. The cylinder head is detachable and the valves are inclosed and have easily removable brackets

Two Madison Chassis—Two Body Models

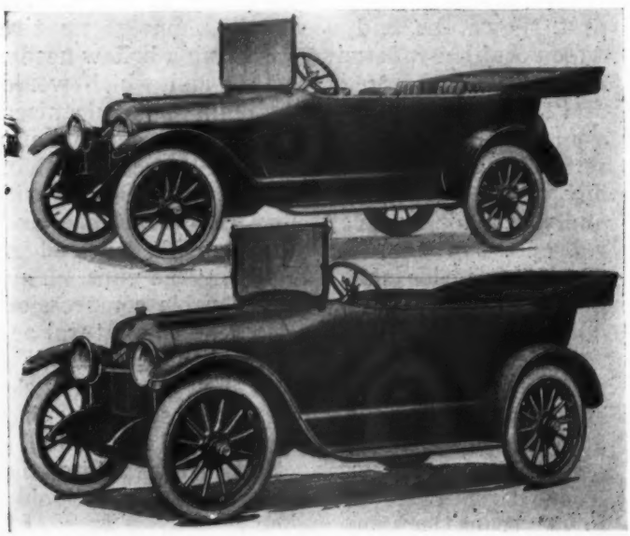
3 1-8 by 5-In. Unit Power Plant Used for Both Five and Seven-Passenger Cars—Refinements and Better Body Lines Are Only Changes for 1917—Valves Accessible

FOR 1917, Madison cars will be constructed upon the 6-40 chassis model and will be made in two body forms for five and seven passengers. Alterations in the body lines form the principal changes and these have been made to correspond to the flat cowl line which is in vogue this season. The prices for the five- and seven-passenger cars are $1,050 and $1,150 respectively.

Models Mechanically Similar

Rutenber engines are used in the Madison cars and the power plant for both the five- and seven-passenger model is identical. In fact the two cars are similar throughout except for a difference in wheelbase necessary to take care of the variation in body dimensions. The five-passenger car has a wheelbase of 115 in., while the seven-passenger has 124 in. A two-passenger roadster can also be secured if desired.

A unit power plant is used, the engine being direct-connected to a Muncie Gear Works gearset and clutch. Naturally in using the Rutenber power plant the improvements made in this during the past year have been incorporated in the Madison engines. The bore is 3⅛ in. and the stroke 5 in., and the six L-head cylinders are cast in a single block integral with the upper half of the crankcase. The valves are inclosed and the cylinder head is detachable.



The two 1917 Madison models, the seven-passenger being illustrated above and the five-passenger below. Note the new body lines with flat cowl effect

Three-Point Suspension

Three-point suspension is used and the rear support is secured by two legs on the rear of the crankcase casting. The third support is at the forward end of the engine and this is flexible, allowing the engine parts to be independent of any weaving of the frame. The pistons are cast iron and are fitted with three rings, two of which are close to the top and the third located just beneath the wristpin boss. The connecting-rods are of I-beam section, being drop-forged. The crankshafts are from 0.40 carbon steel and are balanced on the Norton machine before assembly.

Drop-forged camshafts, are used, the carbon content in this case being 0.20 and the diameter 1⅛ in. The cams are integral with the shaft and are hardened and ground, being carried in plain bearings at the center and front and at the rear in a double row S. K. F. self-aligning ball bearing. The valves are actuated by mushroom type flat followers which are offset 1/16 in. to distribute wear.

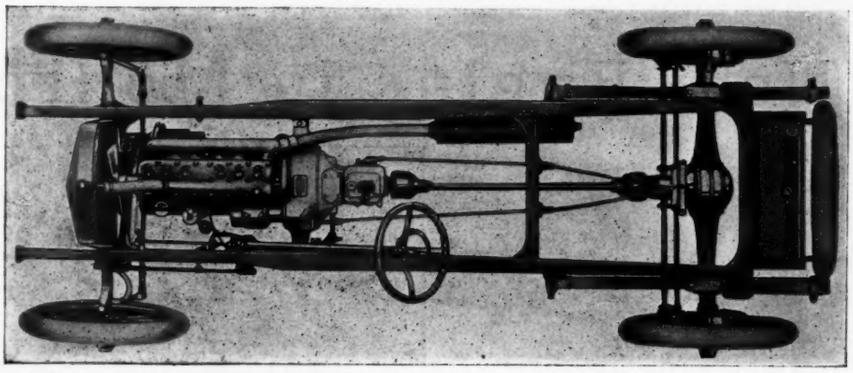
Valve Brackets Easily Removable

Two steels are used in the manufacture of the valves, carbon steel being employed for the heads while alloy steel is used for the stems. The diameter of the valve is 1 5/16 in. in the clear with a 5/16 in. width. A feature of the valve construction is that the entire valve bracket together with the lifting mechanism can be removed from the engine without disturbing the camshaft. This is done by removing the cover plate and stud nuts and then turning the crankshaft by means of the starting crank until the valves are at their lowest level. In arranging the valve timing the intake opens at 15 deg. after top center and closes 50 deg. after bottom center. The exhaust valve opens at 45 deg. before bottom center and closes 10 deg. after top center. Compression is 75 lb. absolute.

Power is transmitted by means of the Muncie Gear Works

dry-plate multiple-disk clutch, which is fitted with alternate disks of asbestos and saw steel. Annular bearings are used in the clutch release and these are lubricated by oil which is allowed to enter from the crankcase since the clutch housing is in direct communication with this part of the motor. The gearbox is a conventional three-speed unit of the selective type.

Two universals are used in the drive, the power being taken through the propeller shaft to a floating rear axle fitted with a pressed steel housing and Brown-Lipe nickel steel spirally cut gears. The axle shafts are supported on large annular bearings of heavy duty design and alloy steels are used throughout in the parts carrying the driving and torsion stresses. Hotchkiss drive is used, both torque and propulsion being taken through the rear springs.



Chassis of the 1917 Madison, showing three-point suspension of the unit power plant. Hotchkiss drive is used. The only material difference in the two chassis is in the dimensions affected by the difference in wheelbase

Remy Electric System

Electrically the Madison cars are Remy throughout. Starting is by an independent series-wound Remy motor used in connection with the Bendix drive for meshing the starting pinion with the flywheel ring gear. For lighting and current supply there is a Remy generator mounted on the right side of the engine and driven directly off the priming set. This generator unit also carries the Remy ignition distributer which is driven through a worm gear from the generator shaft. The generator also carries the regulator and automatic cut-out operating in connection with the Willard storage battery.

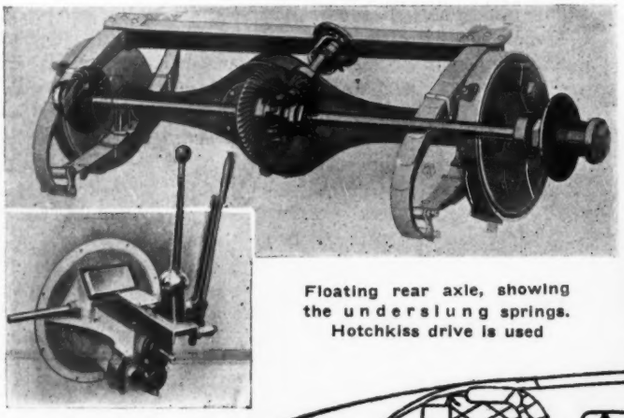
The gasoline system is composed of a 16-gal. tank supplied with a gage mounted on the rear of the chassis, a Stewart-Warner vacuum system, and a model M Rayfield carbureter provided with automatic air intake and climatic dash adjustment. Steering is by the T. W. Warner irreversible worm and full gear used with a steering wheel having an 18-in. corrugated rim. The wheels are artillery type 34 by 4 in. provided with demountable rims and an extra rim is located on the rear for carrying a spare tire. The tire equipment is Goodyear 34 by 4 in. all around, with the All-weather non-skid tread on the rear. Three-quarter elliptic underslung rear springs are used and the front are semi-elliptic. The steel used in the manufacture of these springs is English manganese with a double heat treatment.

Upholstery is in long grain black enamel leather with deep Turkish type cushions. On the five-passenger body a single front seat and rear seat are used, while on the seven-passenger the boat-shaped design is carried out with divided front seats and auxiliary seats which fold against the backs of the front seats entirely out of the way when not in use. The Madison standard body color is Richelieu blue.

Both bodies will be seen to follow the lines that are customary for the 1917 season, particularly as regards the flat section at the point of juncture between bonnet and cowl. The body curve sweeps back into the rear of the tonneau without a break and on the whole the design is one of smooth continuity. Particular attention is also being paid to seating arrangement and comfort this season, the camber of the seats and the curve of the seat backs being carefully worked out to fit the average passenger.

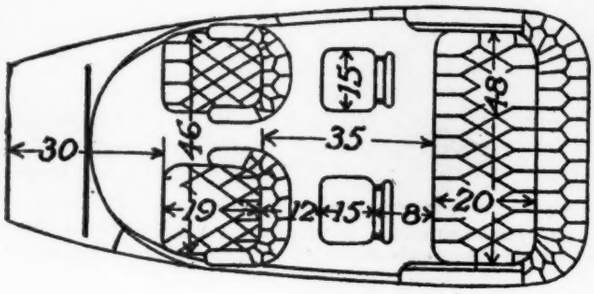
Equipment Is Complete

Full equipment is provided and included at the list price. Among the accessories provided with the car are a one-man top made of Neverleak, electric horn, Stewart-Warner speedometer, ventilating and rain-vision windshield, tire carrier, foot and robe rails, trouble lamp and a full tool outfit.

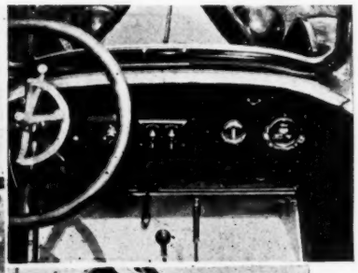


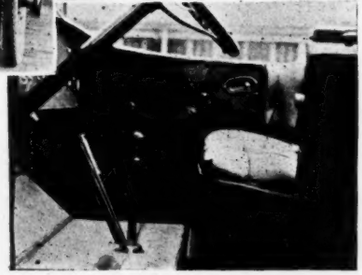
Floating rear axle, showing the underslung springs. Hotchkiss drive is used

Above—Details of mounting of gear-shift control levers on 1917 Madison



Right — Madison body layout, showing dimensions

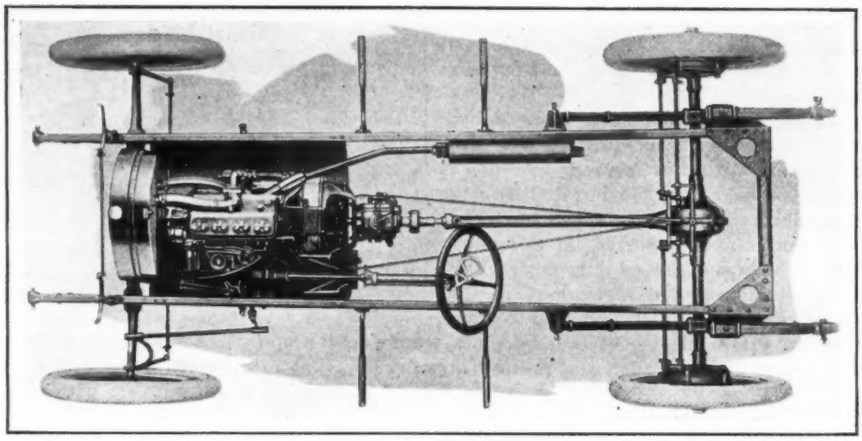




Above—Tire carrier, instrument board and a view of the driver's compartment in the 1917 Madison

New Engine in Monroe Roadster

3 by 4 1-4 Block Power Plant of Brush Design with Overhead Valves—Disk Clutch Replaces Cone—Added Equipment —Price Higher



Chassis of the Monroe roadster for 1917, showing layout of the new power plant. This has overhead valves with outside adjustments. Note driveshaft torque tube

THE Monroe Motor Co., formerly located at Flint, Mich., but now at Pontiac, Mich., is now ready with its 1917 four-cylinder roadster, the only type of machine which it is making at present. Looking somewhat the same as the previous model, the new car, which is designated as model M-3, has a number of improvements over the model it replaces, all of which tend to make it a much better car. The price has been raised from $495 to $565, partly due to the added cost of materials, and partly to the added equipment and improvements in design and construction.

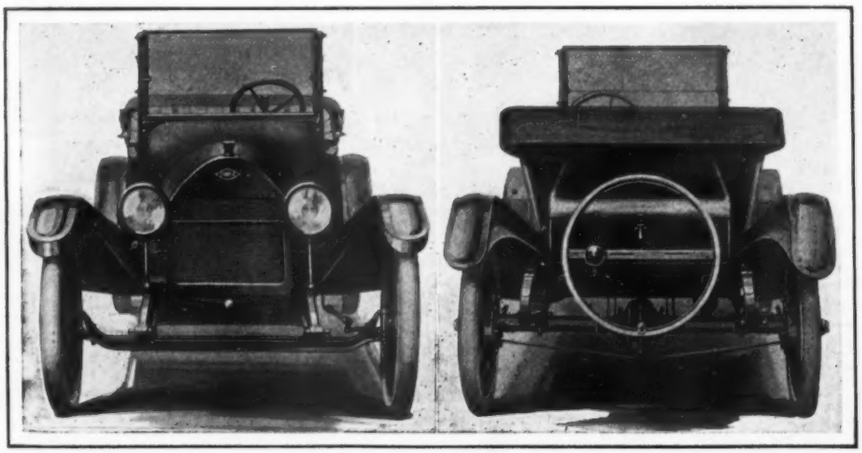
Chief among the changes over the preceding Monroe is the adoption of an entirely new engine to replace the 3⅛ by 3¾ in. type used last year. The new power plant is designed by the Brush Engineering Assn., Detroit, and has the same overhead-valve construction with outside adjustments that characterizes most of the engines Brush now lays out. This new block engine has a bore of 3 in. by a stroke of 4¼ in. and has the gearset in unit.

Along with the engine change, a multiple-disk clutch takes the place of the cone previously used and in the chassis there are several other modifications. The frame has been lengthened 3 in. at the rear to accommodate the longer rear deck now fitted, and the ratchet foot pedal that controlled the emergency brake heretofore has given way to the standard method of emergency control by a hand lever. In front of the radiator a sheet metal piece has been fitted between the frame rails. This helps to send the air to the radiator, and also acts as a mudguard for the radiator.

Crowned fenders have replaced the flat variety of last year, and they do much to enhance the outward appearance. This, together with the lengthening of the body back of the seat, suggests a larger vehicle, even though the wheelbase remains unchanged at 96 in.

Several additions have been made to the equipment. Demountable rims have replaced the clincher type, and in the rear the tires are non-skid treads instead of smooth. A muffler cut-out has been put on; a sight oil-feed has been put on the dash; a lock switch for protection against theft of the car has been added, and there is also a Stewart-Warner speedometer, no speed-indicating instrument being furnished as standard equipment previously.

Looking more closely at the details of the engine the cylinders and upper half of the crankcase are cast in one piece, a construction very often employed where the cylinder-head is removable, as in this case. The rocker arms and valves are carried in the head unit, being inclosed within a single cover plate that bolts to the top of the cylinder head. Protruding through the top of this cover plate are the adjusting nuts which, after the lock nut has been loosened, can be turned by hand until the proper clearance between the end of the valve stem and the rocker is obtained. The valve push rods run up to the rockers on the left side of the engine and the spark plugs enter the cylinders between the two rods of each cylinder as necessitated by the overhead valve construction.



Giving an idea of the 1917 Monroe roadster both coming and going. The splash guard shown in the front view helps direct air through the radiator

Units Compactly Mounted

Manifolds are on the right side, the intake having but a single connection to the carbureter pipe at the center of the head casting. Hung from a bracket, attached to the right rear side of the upper crankcase, is the Auto-

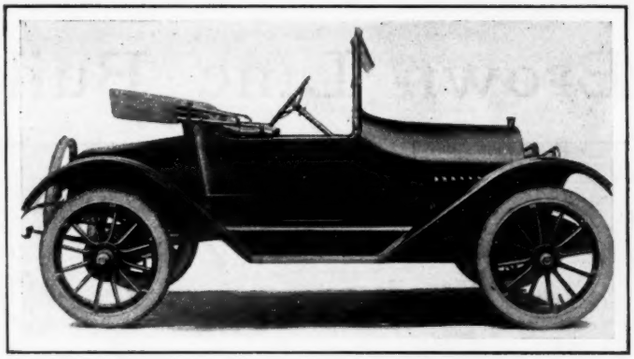
Lite starting motor, which is geared to the flywheel by means of the Bendix automatic starter drive. On the left and driven through gear connection with the camshaft is the generator, also an Auto-Lite unit. This generator has mounted on its top the ignition coil, and its rear end carries the vertical Connecticut ignition distributer which connects to the armature of the generator by helical gears. The flywheel is only semi-inclosed, due to the use of a form of bell housing which extends back from the crankcase and integral with it, until it meets the forward extension at the gearbox. Thus the lower half of the flywheel is exposed, as well as a portion of the upper part where the crankcase extension is cut out to reduce the weight without affecting the strength.

Peculiar to the Brush type of overhead valve engine, the rocker arms which transmit the upward motion of the push rods into a downward motion on the valves are not carried on rocker shafts as is usually the case. Instead, the rockers, which are steel pressings, have formed at their centers a socket which rests on a pivot and allows the same rocker motion that would be possible if the conventional form of shaft were used. The pivot is simply a threaded pin which seats in the body of the head, and its end protrudes through the top of the cover plate as already mentioned. Thus, adjustment of the rocker is obtained by screwing this pivot in or backing it out as the case may require. The valves are quite large for an engine of this size, having a diameter of 1¼ in., and being operated by a two-bearing crankshaft of generous proportions, the bearings of which measure ⅞ in. in diameter, by 2 7/16 in. long. It is driven from the crankshaft by helical timing gears inclosed in a compact manner.

As a great deal of the smooth running of any engine depends upon the sturdiness of the crankshaft and its support, the main shaft is of good size, having two main bearings, the front measuring 1 9/16 by 2 15/16 in. diameter and length respectively, and the rear of the same diameter, but 3 3/32 in. long. Although a moderately high-speed engine, it is fitted with a comparatively heavy flywheel of 12 in. diameter.

Splash Oiling—Thermo-Syphon Cooling

Lubrication of the motor is by splash, with the trough supplied by a plunger pump drawing its oil from the reservoir in the engine base. Each rod end dips into its trough and splashes the oil on to the several bearing surfaces in the customary manner. Simplicity is also obtained by the use of thermo-syphon cooling. The head casting carries the water outlet to the honeycomb radiator, and water enters the cylinder blocks at the center of the right side. A fan driven by belt from a pulley on the crankshaft is used, this having provision for adjustment of the belt tension by means of an arm attached to the forward end of the cylinder head.



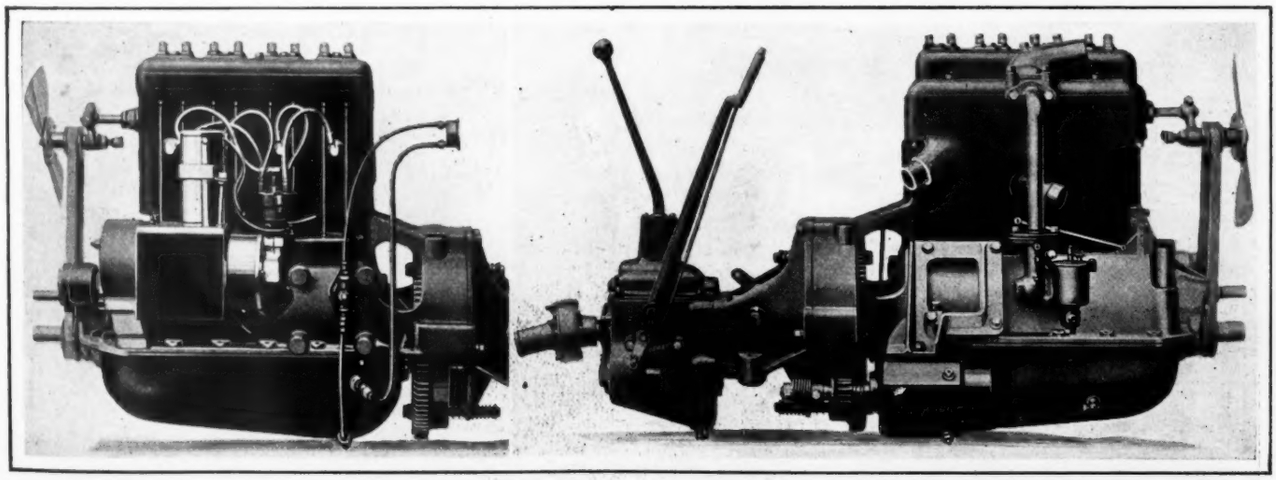
Monroe 1917 roadster which sells for $565. It has a four-cylinder 3 by 4¼-in. block engine and uses 30 by 3-in. tires

From the engine, the power passes through a simple dry-plate clutch having six disks alternately Raybestos and steel. Three selective speeds are afforded by the compactly-designed gearbox, which is mounted in unit with the motor, in the manner already described. The gears are of double heat-treated nickel steel, with stubby teeth to resist driving strains and sudden shocks. The gearshafts are carried on ball bearings. A ball and socket control lever is positioned on top of the gearbox proper, and the emergency brake lever attaches to the right side so as to play over a ratchet sector, also carried on this side.

Back of the gearbox there is a well-inclosed universal joint after which the driveshaft enters a torsion tube which incloses it to the rear axle. Drive is taken through the rear springs, while the torque is provided for by the propeller shaft housing. The three-quarter-floating rear axle affords a ratio of 4¼ to 1. Axles and pinion shafts are mounted on Hyatt roller bearings in conjunction with ball thrust bearings that take care of any end thrust. The axle tubes, which carry the car weight, are riveted into the two halves of the differential housing, and as a strengthening factor a truss rod passes below the housing between the brake drums.

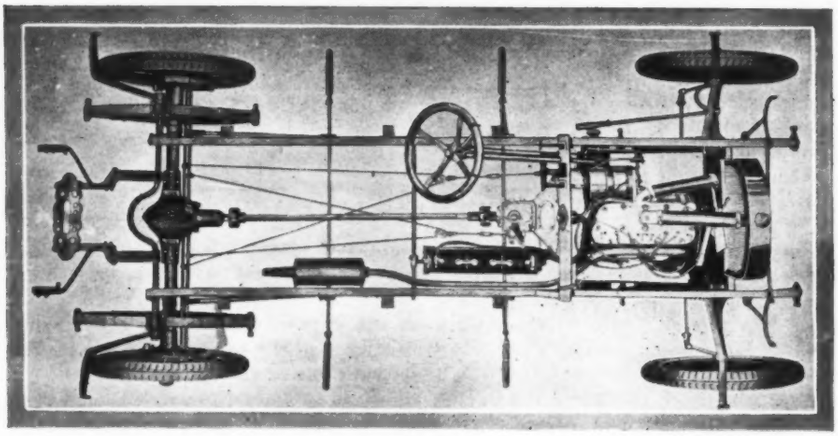
Rear springs, 46 in. long and of three-quarter elliptic form, are fitted at the rear, mounted outside the frame.

The new Monroe is painted a royal blue as a standard color and is said to be capable of speeds ranging from 3 to 50 m.p.h. on high gear. Tires are 30 by 3 in.



Both sides of the Monroe power plant, showing the arrangement of the manifolds, mounting of the electric units and the compact three-speed gearbox. Thermo-syphon cooling is used. Note the connection of the starting motor to the flywheel through the Bendix gear automatic starter drive

Brown Line Built on One Chassis



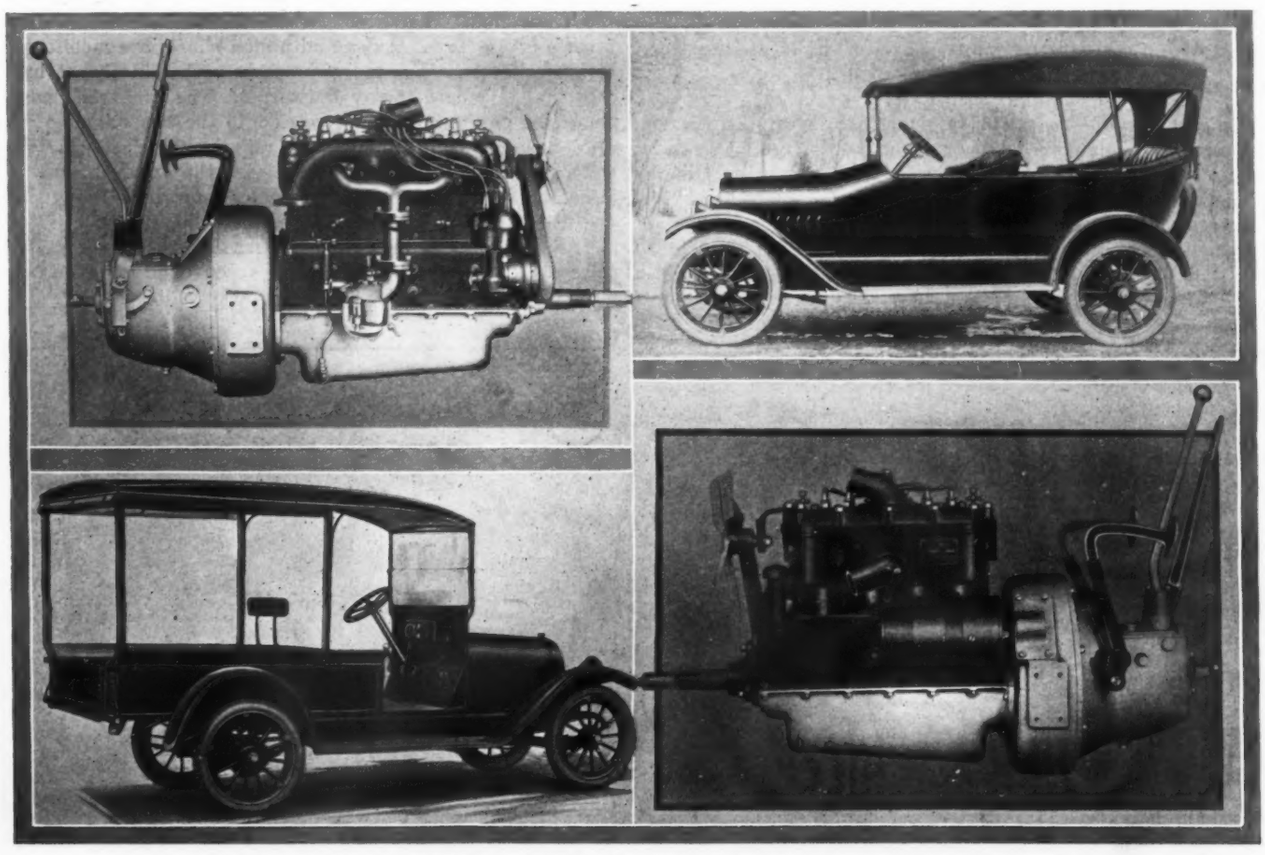
Chassis used for the Brown line of five-passenger touring car and delivery vehicles

A LINE of passenger and business cars has been put on the market by the Brown Carriage Co., Cincinnati, Ohio. This is an assembled product incorporating parts made by specialists among which may be mentioned the LeRoi engine, Walker-Weiss axles, Allis-Chalmers starting and lighting, Atwater Kent ignition, Kingston carbureter, U. S. L. storage battery, etc.

The LeRoi power plant is a unit construction incorporating motor, gearbox and clutch in a single housing. All four cylinders are cast in a single block and are of L-head shape with a bore and stroke of 3⅛ by 4½ in. The valves are on the right side and are completely inclosed. The upper half of the crankcase and the cylinders are in a single casting, while the lower half of the crankcase and the flywheel housing are in one piece and made from cast aluminum. The casting work is considerably simplified by the fact that the entire top of the cylinder is separate, being held in place by fourteen studs to the top of the cylinder with the joint sealed by an asbestos-copper gasket which prevents any leakage or loss of compression.

Large diameter valves are used but the lift is moderate, giving a quiet-running action; the valves are actuated by mushroom type push-rods which have an easy action on the cams. The bearings sizes are ample and the main bearings are all of die cast white bearing metal. The dimensions of the main bearings are 1¾ in. diameter by 2¾ in. length. The connecting-rod bearings are 1¾ by 2 and the camshaft bearings which are three in number are 1⅜ by 2 9/16, 1⅜ by 1⅝ and 1 3/16 by 1 11/16 in.

In order to preserve perfect alignment the flywheel contains a ball bearing which supports the front end of the gearset main shaft. Another point at which the bearings are carefully laid out is at the fan which also operates on



Brown touring car selling at $735 and delivery vehicle at $670 with LeRoi unit power plant used in both

ball bearings and which is adjustable by means of an eccentric insofar as tightening the fan belt is concerned. In the cooling layout the water inlets are large and are ample to take a 2-in. hose. The water is circulated by the thermo-syphon system.

Lubrication is by combined pressure and splash system with the oil delivered at either end of the engine by means of the oil pump and with the bearing taken care of by splash. Ignition is by the Atwater Kent system with automatic spark advance and in connection with the U. S. L. storage battery.

The balance of the electrical system is made up of the Allis-Chalmers motor-generator. With this system the instrument becomes a generator when the motor is running at speeds sufficient to charge the battery and becomes a starting motor when the gasoline engine is stopped and the starting switch closed. The characteristics of the engine are such that under ordinary conditions, the motor is cranked at more than 130 r.p.m. The storage battery floats on the line so that the lighting current is drawn directly from the battery.

A Kingston float feed carbureter is employed. This is a single adjustment type in which the only regulation is that of the needle valve governing the gasoline flow. The gasoline is fed to the carbureter by gravity flow and, as will be noted from the side view of the engine, the carbureter is placed low enough to insure a steady flow even on a steep grade. The carbureter is mounted on the right side of the engine together with both inlet and exhaust manifold and the ignition distributer drive, leaving the left side free except for the motor-generator, which is placed at the rear.

A multiple disk clutch is used lined with Raybestos. It is provided with six coil springs which insure perfect contact. The selective type gearbox is provided with three speeds and transmits the drive to a three-quarter floating Walker-Weiss rear axle. This is geared 4.25 to 1 on direct and the gears are of nickel steel with chrome nickel drive shafts carried on Hyatt high-duty roller bearings. The springs are of chrome steel with full elliptic rears. The front springs are conventional semi-elliptic. The wheelbase is 105 in. and the tire size is 30 by 3½ with non-skids front and rear. Demountable rims are used and one extra is provided on the touring car. Both Batavia and U. S. tires are used.

Full equipment is provided with the car, the top being a one-man mohair. The fenders are crowned and the running boards are covered with linoleum bound with aluminum.

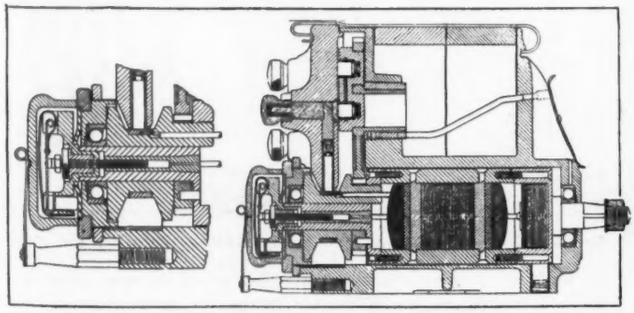
On this same chassis there is a five-passenger touring car at $735, a delivery car with 1000 lb. capacity at $675, a rear-door delivery at the same price and a general delivery open body at $670 including canopy.

Simplex a High-Tension Magneto

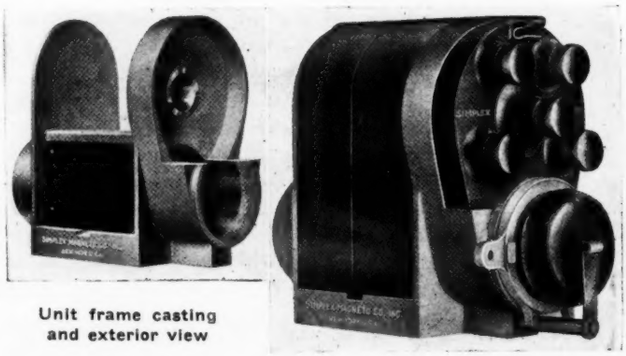
A NEW high-tension magneto has been put out by the Simplex Magneto Co., Inc., New York City. The men making up this organization have been connected with the manufacture of parts for European and American magnetos and have now organized to produce a complete instrument.

One of the features of the magneto, which is a high-tension type, and which in general is designed along conventional lines, is the simple interrupter which is so constructed that the centrifugal force of its moving parts is absorbed, thus maintaining an equality of pressure between the contact points and giving the same working conditions at high or low speeds. Another feature of the instrument is the ready accessibility of its vital parts, and the ease of disassembling to make minor repairs. An additional point of originality is the cast-in pole piece which is a laminated structure but so arranged that it does not have to be pierced by pins or bolts which would tend to increase the magnetic reluctance. The pole pieces and housing being integral, the air gap between the armature and field poles is very small. This tends to increase the intensity of the spark at low speeds, and, furthermore, since the poles and housing are integral they can be bored together to insure their alignment, and also renders the construction inherently waterproof.

As an example of accessibility, in removing the armature it is only necessary to turn a check nut and unscrew the armature ball-bearing cage. This allows the armature to be taken out of the frame without removing any of the parts.



Section through the Simplex high-tension magneto



Unit frame casting and exterior view

In connection with the armature an interesting feature is the construction of the condenser which is arranged with specially prepared insulating sheets between the individual foil laminations. This permits of a large number of sheets of useful foil, as the insulating sheets are very thin, giving an efficient indenture which tends to prolong the life of the points.

In general the Simplex magneto is a high-tension type carrying both the low tension and high-tension winding upon the single armature. The core is of laminated iron and on each side of this is a pole piece of the same quality of iron as is used in the armature. Holding this whole construction together are two bars which are firmly riveted into the pole pieces.

The details of wiring, etc., do not differ greatly from standard practice in high-tension magnetos. The low-tension winding has one terminal grounded and the remaining terminal is connected to an insulating plug allowing the path of the circuit to pass through the interrupter contact. The cam plate allows the spark advance to travel through an arc of 30 deg. and the interrupter mechanism is spring actuated giving a quick and snappy break of the primary circuit. The high-tension wire is attached to the distributer ring on one terminal and on the other to the ground by means of the common ground brush. The distributer mechanism is arranged for either four or six contact pieces, depending on the number of cylinders.

The Rostrum

Why Races Run Counter-Clockwise

EDITOR THE AUTOMOBILE:—Will you kindly advise the reason why practically all racing of every description is run in a direction from left to right, facing the track from the grandstand? It appears just as feasible for the entrants to face in the opposite direction, as racing cars, for instance, have the driver on either right or left side of the car which makes it apparent that racing in either direction should be practicable.

New York City. S. L. H.

—At the time the decision was made regarding the running of the races on the Indianapolis motor speedway anticlockwise it was for the reason that practically all the racing cars driven at that time had the steering column on the left-hand side of the machine and the driver's weight being on the left-hand side of the car naturally made the center of gravity and weight center a factor. Aside from this, it is natural to drive turns to the left with the right hand on the pulling side of the steering gear. If you are right-handed you will notice that it is always easier to control your car on the left-hand curve rather than a right-hand.

Conditions Due to Low-Test Gasoline

Editor THE AUTOMOBILE:—Is it not a fact that the low test gasoline of to-day causes the carbureter float to ride higher and consequently the level to maintain itself lower than with the gasoline of a few years ago?

2—In adjusting carbureter for this low test gasoline, in addition to changing level, is it advisable to use a slightly smaller jet?

3—Does not the action of atomization of gasoline in the carbureter cause the intake manifold to be cool, and is it not true that the richer the mixture, the cooler the manifold will keep? I have never seen an engine overheat due to a heavy mixture, but always with a lean one. Anyone can satisfy himself of this fact who has a Boyce Moto-Meter on the radiator.

4—Will not a manifold keep cooler with low test gasoline than with one of higher test and will not that coolness of manifold aggravate the difficulty of the carbureter to properly break up the fuel, unless heat is supplied in greater volume than formerly?

5—What is meant by low and high test? Is it density or specific gravity and what is the ratio between the two?

6—Is it true that if the slightest bit of acid used in refining oil should remain when graphite preparations of any sort are used mixed in the oil it will cause a stoppage in piping of oiling system?

7—Is it true that low test gasoline has more heat units and that a car will run farther on a given quantity than on the same quantity of high test gasoline?

Islip, N. Y. W. L. B.

—Yes, to an extremely small extent.

2—A smaller jet can be used sometimes but the difference must be very slight.

3—Yes, heat is required to vaporize the gasoline, and this is obstructed to some extent from the intake manifold. Obviously, the greater the amount of gasoline evaporated the greater the cooling effect on the manifold. Your experience regarding the effect of a heavy mixture on engine temperature is not normal.

4—A manifold will not keep so cool with low test gasoline, though it is also true that some heat is required.

5—Low and high test refers to the density. There is no ratio between the two, the words being used in a very loose way.

6—Yes.

7—The heavier oil contains more heat units per pound, but it is harder to make a good gas from it, wherefore it is usually impossible to obtain a greater mileage per gallon.

Oiling System of 1911 Pope-Hartford

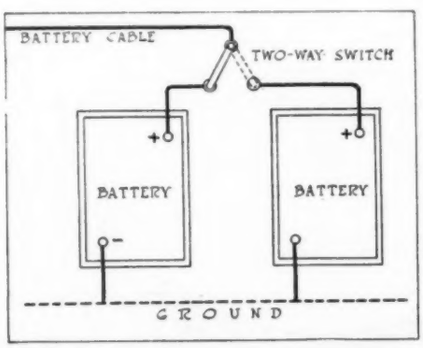
Editor THE AUTOMOBILE:—How does the oiling system on a 1911 Pope-Hartford work and how is same adjusted?

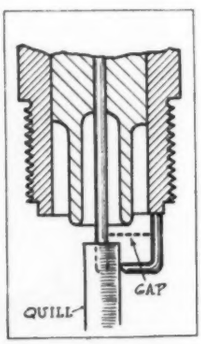
2—What is the correct timing of a 1914 four-cylinder National?

Providence, R. I. R. P.

—A mechanical oiler is located on the crankcase fitted with pumps, and an overflow standpipe. The bottom half of the crankcase is constructed with the oil reservoir beneath and cast integrally with it. In supplying the lubricating system with oil the mechanical oiler is first filled. The surplus oil runs into the crankcase, leaving the proper amount of oil in the oiler. The crankcase is also filled up to a level cock and holds about 3 gal. of oil. The pumps in the mechanical oiler force the lubricant to the cylinder and in addition a large suction pump sucks oil from the reservoir in the crankcase into the mechanical oiler, maintaining the proper level in this device.

Oil should be added through the filling tube every day or as often as necessary to bring the level high enough so that oil will run from the upper petcock which acts as a level gage. It is important that the oiler be adjusted so that one drop only at a time will show in the sight feeds to each cylinder. The leads are regulated by micrometer adjustment. The pipes run to the four cylinders and one adjustment takes care of the No. 4 cylinder and the sight feed on the dash. Individual sight feeds are fitted.





Left—Fig. 1—Connections for a two-battery ignition circuit, showing the use of two-way switch

Right—Fig. 2—Method of testing spark plugs by the use of a quill toothpick. By insulating the points the spark is made to jump a much larger distance than when in ordinary operation

The main crankshaft bearings are lubricated by splash, suitable pockets being cast on the inside of both ends and center of the crankcase for this purpose. The camshaft has four bearings all inclosed within the crankcase which are lubricated entirely by splash, suitable oil pockets, holes and grooves being provided for the purpose.

2—You do not mention the model to which you refer, but it is presumed that the information you desire is on the four-cylinder design. A timing diagram of this is given in Fig. 3.

Mistimed Spark Causes Power Loss

Editor THE AUTOMOBILE:—I have a C-36 Buick which does not have the ginger it used to have. In making hills on which it used to gain it now loses.

An expert on Buicks has ground the valve and cage seats, scraped the carbon out, seen that the cages were in right by taking the manifolds off, cleaned and adjusted the carbureter and adjusted the pushrods. Compression is good. Still there is no more snap to it. It also knocks when speeding up from 10 m.p.h. with spark well retarded. The bearings are all right.

Would burning out the cylinders and slowing down the timer stop the knock in picking up speed?

Lowville, N. Y. C. A. R.

—A possible explanation of your trouble is that the timer cam on the distributor shaft has slipped so that the spark is out of time. This a Buick service station will check up for you very quickly, if there is one near you.

You say the carbon has been scraped out, but if the cylinders were not removed to do this there will be a great deal left in which case burning out would be the cure.

Yet a third possibility is that the carbureter adjustment is incorrect.

A Method of Testing Spark Plugs

Editor THE AUTOMOBILE:—Referring to inquiry of E. E. F., Olmstead, N. D., in THE AUTOMOBILE for June 1, it may help him to know if his spark plugs are all right if he forces the spark to jump a decent gap. Naturally he cannot separate the points, but he can often introduce a quill or similar insulation between the points and make the spark jump a much larger distance. In most plugs it is possible to get a gap of ¼ to 5/16 in. or even more and this length of jump is pretty good evidence that the plug insulation will stand the voltage necessary to make the spark jump the point gap when under working conditions. Quills can be found at every poultry yard if in the country and quill toothpicks at many hotels. A piece of mica or celluloid can be used but not so handily on many forms of plugs.

Fig. 3—Timing diagram of 1914 four-cylinder National

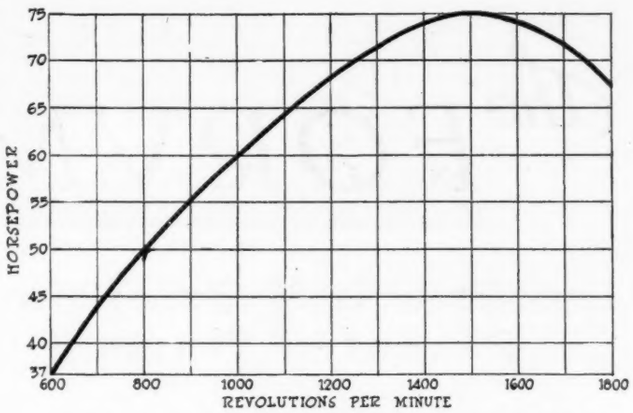


Fig. 4—Power curve of the 1910-1911 type 16 Lozier of 45 hp.

Crank and Eccentric Differential

It may interest your readers to know that the crank and eccentric differential described by Mr. Ormsby in his comprehensive article on differentials was invented by Edwin J. Gould, formerly of Colorado, but more recently of San Diego, Cal. Mr. Gould has spent much thought on the gearless differential problem and has recently made improvements to overcome some defects found in the original form.

Philadelphia, Pa. CHAS. E. DURYEA.

Wiring for Two-Battery Circuit

Editor THE AUTOMOBILE:—I have a car equipped with a double ignition system and am using one storage battery for starting on battery, electric horn, rear lamp, two dash lamps and one lamp inside of the car. As I have another battery, will you kindly publish a sketch showing how I can wire up these two batteries so that when one runs down I can switch on the other without taking one out or changing over any wires.

2—Kindly publish power curve of 1910 45-hp. Lozier.

3—Where can parts be bought for a 1905 Rochet-Schneider?

New York City. A. W. B.

—Presumably one terminal of your battery is grounded by a wire connecting it to the frame. In fitting the second battery it will be necessary to see that the corresponding terminal is grounded, that is to say, if you ground the negative terminal on the first battery it must be the negative terminal on the second battery that is also grounded. You can then readily use one battery or another by shifting over the wire attached to the positive terminal. To introduce a switch take the present battery wired to the middle point of a two-way switch and bring two wires from the two batteries attaching them to the other two contacts of the switch. Then by throwing the switch either one way or the other you can use either battery. The connections are precisely the same as those employed for an ignition switch which gives you either battery or magneto, as illustrated in Fig. 1.

2—Power curve of 1910 Lozier appears in Fig. 4.

3—THE AUTOMOBILE has had several requests for this information but has been unable to trace any stock of parts in America. It would probably be cheaper to have the parts made specially here than to get them from France.

The FORVM

LEAK-PROOF IS THE McQUAY-NORRIS PATENT TRADE NAME—ALL-YEAR CAR AND HUNDRED POINT SIX ARE KISSEL TRADE NAMES

Leak-Proof Is McQuay-Norris Patented Name

By L. A. Safford

Second Vice-President, McQuay-Norris Mfg. Co.

THE manufacturer of a nationally known and standardized trade-mark must of necessity jealously protect it. Our trade name, Leak-Proof, has been nationally standardized through extensive advertising and the phrase Leak-Proof is our own registered trade-mark.

Like many pioneers in a new field, this company has suffered through misuse of our trade-marked name, Leak-Proof, which applies specifically and only to the piston ring manufactured by this company. It is not a descriptive phrase pertaining to a type of ring, yet some automobile and engine builders who are departing from the conventional type of one-piece ring have described their ring equipment as being leak-proof or of a leak-proof type. The injustice of this is manifest.

Therefore, we will appreciate your giving publicity in the columns of THE AUTOMOBILE to this letter and the fact that there is no Leak-Proof piston ring except our patented, trade-marked product, which is not used by any automobile or automobile motor builder as universal equipment. Leak-Proof piston rings are sold only through jobbers and dealers for replacement purposes.

All-Year Car and Hundred Point Six Kissel Names

By H. F. Daniels

Kissel Motor Car Co.

ALL-YEAR car and Hundred Point Six are Kissel trade names. The first identifies the detachable top idea originated by Kissel. The second identifies a new and highly successful Kissel model recently introduced.

May we ask your co-operation against any who attempt to trade upon the reputation of our product by using either of these phrases?

We cheerfully acknowledge that it is largely due to the vigilance and sense of fairness of the press that All-Year car has not appeared extensively in connection with other cars.

We hope for this same vigilance and sense of fairness from you in regard to the Hundred Point Six.

Advantages of Metal Mesh-Type Running Boards

By M. K. Woodford

IN recent years most of the cars seem to be equipped with running boards of wood covered with linoleum or some similar substance, and after a comparatively short terminal service their appearance is usually far from a credit to the owner or manufacturer. Of course, some fastidious owners or operators of cars manage at the price of eternal vigilance to keep their running boards in good condition, but this is the exception rather than the rule.

Back in 1909 and even as far back as 1907, I remember a type of running board being in use which seems to me a much more serviceable and satisfactory construction than those employed at the present time. The boards to which I refer were made of strips of metal in zigzag fashion so that when the strips were placed side by side with their plane surfaces vertical they formed a sort of mesh. Two heavier metal strips formed the edges of the board and ⅛-in. bolts passing transversely through these and the intermediate strips secured them in place. Running boards built in this fashion were durable and of excellent appearance, having no linoleum covering to become streaked and spotted with oil or to stretch and bulge so that holes eventually appear.

The metal running board does away with the necessity for a scraper to remove mud from the shoes when entering the car and in case of the running board striking some object the metal strips are readily bent back into shape, thus saving the expense of the repair work necessary with the wooden boards when damaged. I would like to draw the attention of our car manufacturers to this minor but interesting feature of construction.

Car Needs Hand Brake in Alps

By M. Quesney

IN reading THE AUTOMOBILE for May 18, I find in the paragraphs on Current Topics an extraordinary Forum paragraph on the uselessness of the hand brake. Well, has the writer ever motored in mountains? If not, let him come in the Alps and try a dozen or more Alpine passes over 6000 ft. The glacier road, for instance, which goes to 8600 ft. or so, the last 4 miles 15 per cent grade with a round dozen of hairpin corners. The only sound and agreeable way I have found to coast down these roads is to engage second gear, switch off the magneto, shut off the gas and push the hand brake, more or less, so that you never come to more than 20 m.p.h. in the straight bits, then slow down at the corners with the foot brake, which is on the transmission and not on the back wheels. Of course, the average speed is very low, some 14 to 15 m.p.h., but you go there for scenery and not for mileage. Incidentally, my car is a small 7 hp., 56 by 120 mm. DeDion-Bouton, with a single seat and having a very short wheelbase, which is by far the best thing I have found for those roads.

Farm Motor Machines at British Show

Exhibition Curtailed by War Restrictions But Registers Growing Demand for Gas-Tractors and Plows

AT the 77th annual show of the Royal Agricultural Society at Manchester, England, the number of visitors rose to 149,000, as compared with 104,000 at the show of last year, at Nottingham, which was the first during the war. Previously the record attendance was 217,000 in 1897.

Though the number of exhibitors was larger than ever at the show as a whole, and especially in the live-stock department, the exhibition was not fully representative of the development in farm motor machinery, partly because manufacturers were busy with war work and partly by reason of restrictions ordered by the Minister of Munitions, excluding tractors applicable to other purposes as well as to agriculture. The resulting fragmentary character of the show is reflected in the reports of it, as contained in *Commercial Motor*, *Engineering* and *The Engineer*, from which the features and illustrations presented in the following are selected. In a general way it is notable that steam tractors no longer predominate absolutely over tractors or self-contained motor plows powered from internal-combustion engines.

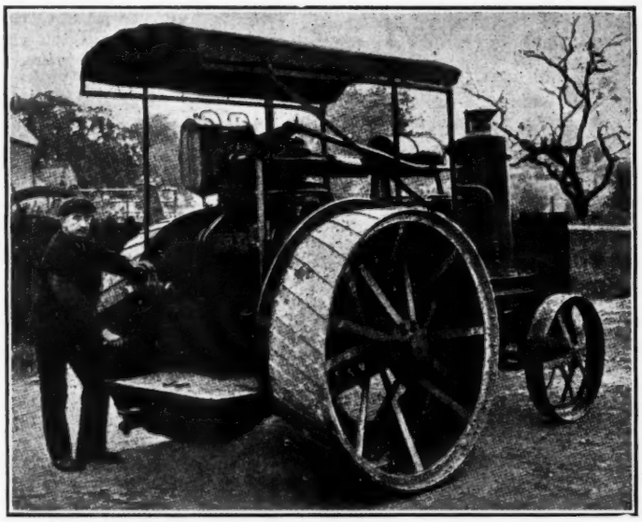


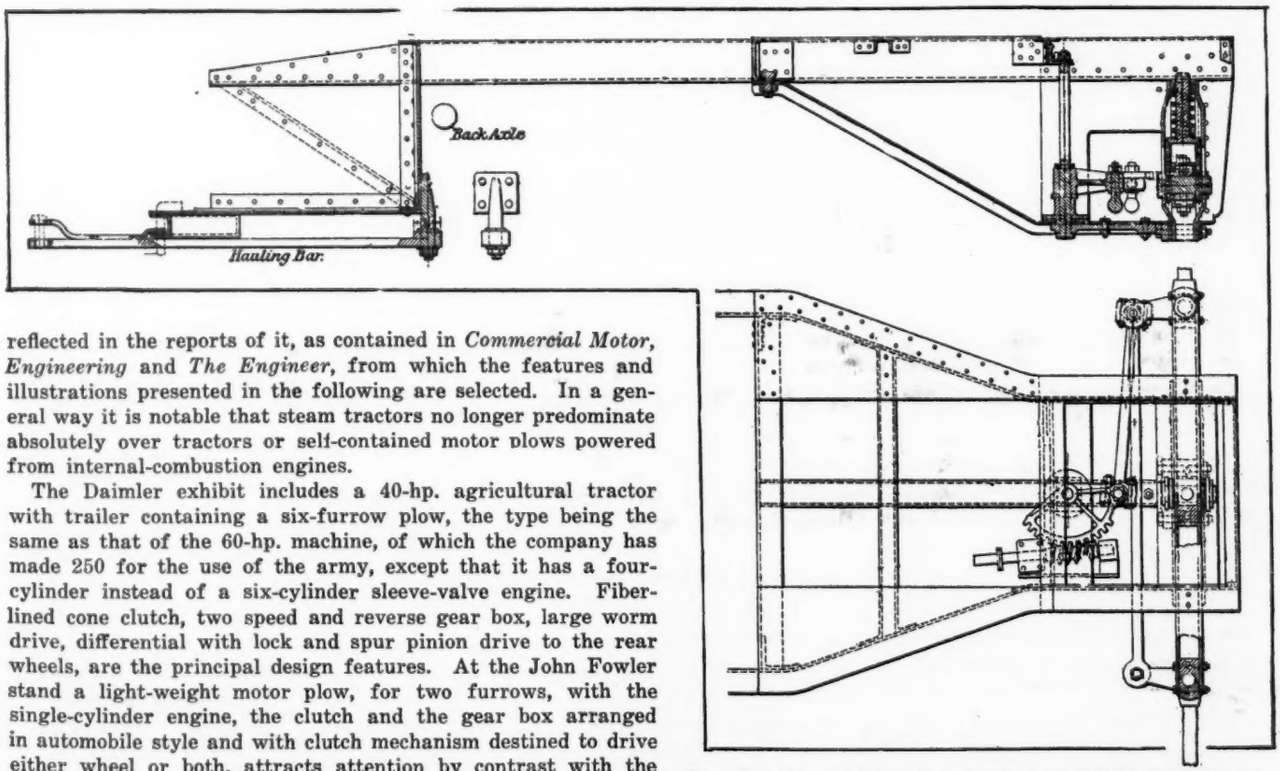
Fig. 1—The Omnitractor, a recent development in general-purpose tractors for use on farms

The Daimler exhibit includes a 40-hp. agricultural tractor with trailer containing a six-furrow plow, the type being the same as that of the 60-hp. machine, of which the company has made 250 for the use of the army, except that it has a four-cylinder instead of a six-cylinder sleeve-valve engine. Fiber-lined cone clutch, two speed and reverse gear box, large worm drive, differential with lock and spur pinion drive to the rear wheels, are the principal design features. At the John Fowler stand a light-weight motor plow, for two furrows, with the single-cylinder engine, the clutch and the gear box arranged in automobile style and with clutch mechanism destined to drive either wheel or both, attracts attention by contrast with the better known large Fowler units. Either wheel can be raised to ride on top of the land with the other in the furrow. The control is from the rear where a seat for the driver is accommodated on a castor wheel. A belt pulley is mounted on the engine shaft in front of the radiator.

The 24-hp., three-wheeled Ivel tractor is shown with a device for heating the fuel by the exhaust gas, so that kerosene may be used after starting with gasoline. The engine is a two-cylinder, horizontal-opposed located amidships on the off side and drives by silent chain to a countershaft and thence by roller chain to the differential on the rear axle.

The Martin Cultivator Company's two-furrow plow is the lightest machine with caterpillar traction belts. Either of these can be elevated.

The Omnitractor is a newcomer with many novel construction details, some of which are shown in the accompanying



Figs. 2 and 3—Showing built-up frame used for Omnitractors, supported upon front axle by helical spring, axle pivoted in its vertical plane, wheels steered on automobile plan

illustrations, Figs. 1 to 9 (from *Engineering* of June 30, where a full set may be found). A peculiarity is the extensive use of standard merchant bar steel and sections in popular sizes, the object being mainly to facilitate repairs, it is said. This four-wheel tractor weighs 3¼ tons and can apply a tractive effort of 2000 lb. at the wheel rims. The main features are as follows:

Engine, two cylinders, 6 in. bore, 9 in. stroke, giving 30 hp. at normal speed of 750 r.p.m. Starts on gasoline but can run on kerosene with water injection. Mounted over rear axle, transversely. Chassis entirely of merchant sections (Figs. 2 and 3). Three-point suspension of the frame, the front part being supported on a helical spring at middle of front axle and the axle pivoted. Ackerman steering by worm and sector, as shown.

Driving wheels, 5 ft. dia., 16 in. wide, all built up from sections without use of special forgings (see Figs. 4, 5 and 6). Front wheels, 3 ft. 6 in. dia., 8 in. wide. The drive by large cast steel spurgear wheel supported from wheel rim by four brackets.

Transmission entirely by spur gearing, bevels being avoided to escape necessity of maintaining accurate alignments. Transverse mounting of engine serves this plan. Moving part of clutch is mounted on sleeve which runs loose on engine shaft and at outer end carries belt pulley for driving farm machinery. To drive tractor itself a sliding pinion on this clutch sleeve can be thrown into engagement with gearwheel on differential. The engine speed is governed.

Gearbox gives 2¼ and 4½ m.p.h. forward and one reverse, operated by independent but interlocking levers, the locking device preventing improper operation. Emergency brakes are applied direct to drivers and will hold tractor on any hill.

Cooling system includes centrifugal pump drawing from bottom of fan-cooled radiator into which water flows from cylindrical tank on front end of frame containing large number of 2-in. tubes serving as flues for a draft induced by discharging engine exhaust through a series of jets below a chimney fitted above the top tubeplate of the tank. Loss of water said not to exceed 1 gal. per working day.

Fuel; provision made for heating the air on its way to the engine in order to run on kerosene, with by-pass and valves for switching from and to gasoline.

Differential (Figs. 7, 8 and 9); as stated before, bevels are avoided, and construction is therefore by spur pinions as shown. Locking by dog clutch shown to the right in Fig. 7, operated by lever provided on the foot-plate.

Starting gear on clutch sleeve is of safety type, causing release in case of backfiring.

The Overtime farm tractor weighs a little over 2 tons and has a two-cylinder horizontal engine, with bore and stroke 6 and 7 in., developing 24 hp. at 750 r.p.m. Many of this model, which is of American type and origin, were shown. An American-made tractor shown this year for the first time at the Royal Show was the Bull. The Wyles two-furrow motor plow was shown with no other material changes since last year than an enlargement of the cooling system and a provision for controlling engine speed by correcting the strength of the governor spring. The steam equipments exhibited differed little from those previously known.

Opinions on Different Traction Systems for Farm Work

APPARENTLY realizing that rapid progress in applying motor power to agricultural work depends on clearing up all doubts as to what system of machinery will give best results for a given set of working conditions, *Commercial Motor* presents interviews, one of which represents a decided preference for the cable system, another a conditional preference for the general-purpose tractor and a third perfect satisfaction with results so far accomplished with one of these. It is noted that the cable system advocate, Mr. John Allen, is governing director of the Oxford Steam Plough Company and has been identified with cable-ploughing for 40 years, meaning the system by which the plough is hauled to and fro by attachment to a cable passing around drums of powerful engines, one at each side of the field to be worked.

Condensed statements from each of these interviews are given herewith.

John Allen, advocate of the mechanical drum-and-cable system, says:

Plowing can be done more rapidly by cable than by any other method, so as to utilize favorable weather fully.

For cultivating, dragging and harrowing, traction by cable is acknowledged to be superior, because moving of the motive power over the already plowed land is avoided.

Traction plows are unable to compete with cable plows in quality and quantity of the work on hilly, heavy or clay land and on ridge-and-furrow land.

The field for the tractor-plow lies in work of a supplementary character to that done by cable. It is useful in the rush periods and for owners willing to limit their use to supplementary plowing, breaking up clover stubble and for power purposes, such as threshing.

The "farmer's small plowing set" was formerly much talked about, but now different types of engines are made for different jobs, in response to the demand.

Tractors will never be suitable for cultivating and subsequent operations.

American and Canadian conditions do not apply where it is important to get the largest yield per acre.

American and Canadian tractors are not built to stand up on hard roads and will not endure road-haulage in European countries where roads are hard.

A steam-plowing set (with cable) costs approximately $15,000. *A contractor can make profits with them because he can find work from mid-March to mid-November.*

Skilled labor, used to working with agricultural tractors, will not turn to ordinary farm work, and here lies a source of trouble.

Hereafter, if farm work cannot be done by mechanical means, it cannot be done at all.

Tractors, if light enough, should become useful for reaping and binding, as well as for plowing and stationary work. But the tendency is to make tractors heavier to secure increased output and robustness.

Mr. R. G. Patterson, prominent agriculturist and landowner not yet using motor power in the fields, says:

Mechanical means for cultivation are necessary, but I am not at all sure that a suitable and reliable machine is yet available.

I do not feel specially called upon to do pioneer work for the makers of agricultural machines.

A tractor for the average farmer should not weigh more than two tons, to avoid packing the land as it traverses it, and the price should be less than $1,250.

Engineers must decide how heavy the tractor must be to draw three or four plows or a large cultivator.

With a tractor the farmer can go on with his work when the weather is fit, and does not have to wait for a cable-plow contractor to get through with other work first.

Tractors must be light so as to be usable under the least favorable conditions of soil and weather without harming the surface. But nothing must be sacrificed to obtain lightness.

Mr. J. W. Bradford, who for 2 months has used 2-ton Overtime tractor on 480-acre farm recently taken over in bad condition from neglect, says:

Two shillings an acre covers operating cost, not figuring wages of two men, one on tractor and one on plow.

With a four-furrow plow operated from tractor's seat and arranged to lift each plow as it reaches the end of the furrow, the work can be done by a man and a boy.

I have made a hobby of plowing two or three acres after tea with the aid of my little girl only.

With a tractor you can wait till the good weather comes and then rush the work, while with horses you would fall behind on that plan.

The Portent of Electric Farm Machines

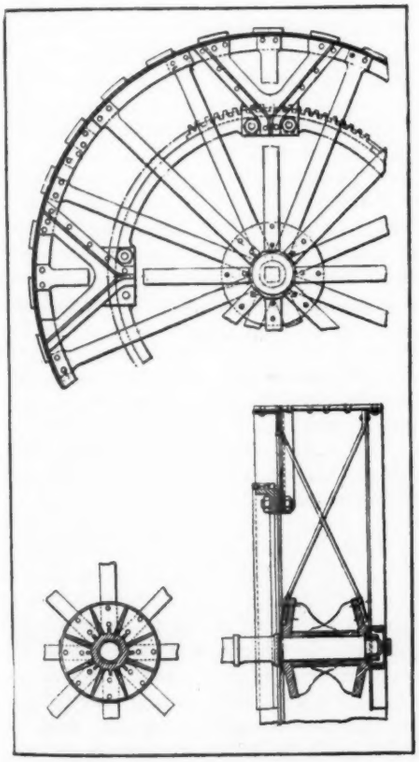
To Protect Sales of Cars and Trucks the Automobile Industry May Be Obliged to Lead Development of Agricultural Motor Machinery and Prepare to Manufacture a Type Adaptable to All Conditions

By Marius C. Krarup

FOR several years descriptions and illustrations of mechanical design and detail in agricultural self-propelled machines have from time to time been urged upon the attention of automobile manufacturers, with a hazy idea that the collaboration of the automobile industry might result in benefits for all concerned. But it has generally been supposed that the decision as to what should be the type of the agricultural machine lay with the farmer and with the implement makers who have been in close touch with the wants of farmers for many years. It has come to be almost accepted that there must be many types of machines, differing radically in the means employed for replacing animal power and locomotion—apart from the necessary differences dictated by the many variations in the nature of the work for the sake of which the power and the locomotion are required. At the same time opinions are varying more and more as to what type of motor machine is most suitable for the average farmer, and on the basis of which the largest and most profitable, useful and interesting business can be created.

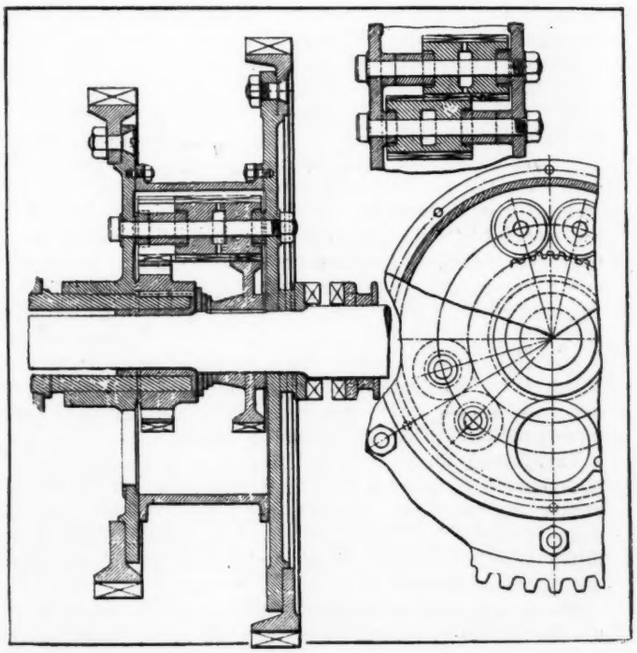
If it can be shown that the type which will win out is liable to throw the manufacture of cars and motor trucks for farmers into the hands of those who make farm machines of this type, the choice and development of this type suddenly becomes a matter of vital importance to the automobile industry, which does not wish to lose its rural trade and, on the other hand, will hail with satisfaction any development that promises to expand it. If a study of the present situation in the design and manufacture of farm machines supports the idea that the eventually prevailing type among these machines will be one—or only may be one—which will take its power from the farmer's automobile or from the motor trucks on the farm, provided the automobile and the motor truck can be and are made suitable for supplying it, no great foresight or imagination is required for discovering that the automobile industry will stand to lose or to gain greatly according to what action its members take at the present time in sizing up the situation.

In the account on the preceding pages of the Royal Agricultural Show at Manchester the emphasis is still on the



Figs. 4, 5 and 6—Construction details of driving wheels for Omnitractor. Hub a steel casting. All the rest built up from merchant sections

Figs. 7, 8 and 9—Spur pinion differential in Omnitractor; less sensitive to misalignment than the bevel pinion type



mechanical details of the "agrimotors" actually exhibited, but from the accompanying extracts of interviews one gets a rather vivid impression to the effect that the waiting and hesitating world is most deeply interested in the choice of the type and consents to examine the mechanical details, ingenious as they may be, mainly because they are helpfully suggestive in the effort for reaching larger and more important conclusions or, at best, because the practical situation is so urgent that an immediate choice must be made in order to get needed work done somehow.

An automobile manufacturer, whether he contemplates to manufacture farm machines, or merely to protect his automobile business, is called upon to go more energetically into the question of type than the prospective user of agricultural machines, to whom any machine may be better than none. Some ideas come up in connection with this subject which may serve to show how relatively unimportant are all matters of mechanical detail in tractors or motor ploughs so long as it is doubtful if a suitable basis for developments has been discovered.

Need of a Basis

Real automobile manufacture began only when Levassor had devised a design having the peculiar property that improvements could be added piecemeal without ripping the previous construction to bits. It was perfectible.

In comparison with automobiles the new field, whose magnitude and promise everybody now sees, presents the enormous difficulty, for the start, that the output must at once be clearly superior in operating economy to the system of farm work so far employed—including investment charges—but also the important easement that machines can be marketed if they only fulfill this first condition for one of the many greatly varying sets of circumstances and classes of work for which agricultural machines are wanted. The easiest requirements, however—those relating to large estates with level or gently undulating land almost free from stones—are precisely those which have been met by the steam plough and farm tractor industry as it exists to-day, and which no other concern in this line can figure on without also figuring on the sharpest possible competition backed by valuable experience. In this section of the market a new concern must at once be able to offer efficiency and economy markedly better than obtained from the machines now sold. If it cannot do that—and this in itself would mean a new type—it has practically only the difficult end of the market to depend upon, for which nobody so far has been able to devise machines that are or can be accepted as final in type or detail.

It is therefore with regard to machines for difficult mechanical or economical conditions that every prospective newcomer must view the subject so sharply in order to make sure that the type he selects to manufacture has the principle of growth in it and is not one which will be scrapped the moment a more generally adaptable type makes its appearance. And, if he does not contemplate to enter upon new manufacture, it is also from this section that the type may arise which may interfere with the business of selling cars and trucks to farmers. Evidently the coming of such a type should be recognized as long in advance as possible. When industrial activities begin to cluster around it, the opportunities for embracing it get scarce. And it is of course more profitable to embrace than to fight it.

The British Show gives but few clues that can be helpful in looking out for what there may be in store of this nature. Steam tractors, gas tractors, cable system, self-contained motor ploughs in different sizes and recourse to the caterpillar traction system—these make the list of expedients mentioned as actual.

The highly desirable adaptability of every machine unit to MANY agricultural conditions is not strongly represented in any of these types. But the eventual type must have that, since not only are there many kinds of farms but each farm as a rule has many different conditions to meet; on upland, low land, rough land, heavy soil, light soil, level land, hillside, and in the varieties of crops which are cultivated.

Designer's Guide Book Wanted

Probably not one-tenth of the things to be considered in a farm machine equipment has ever been brought home to the machine designer in such form that he can keep his mind on them all at the same time and can allot to each of them its proportionate value in the general scheme. And probably one of the most fundamentally useful things that could be done at present would be to arrange a competition for the production of a slender volume—say a book of 200 octavo pages—setting forth in the most orderly and convincing fashion the agricultural requirements to which farm machines should conform; and setting forth also, partly for the information of farmers, an analysis of those mechanical methods for working the soil which differ from customary plowing, harrowing, dragging, weeding, etc., etc. These may be better adapted for operations by machinery than the old methods, which are so clearly an outgrowth of the use of animals and cheap human labor and should not be accepted as a necessary or permanent handicap for machine design, though of course they should not be discarded lightly or prematurely, as so many people know how to work with them and are disinclined to abandon them.

The adaptability of a type would clearly be greatly enhanced if it included that either old or new soil-working tools and methods could be used with it without radical transformation of the basic equipment. The hoe has always produced better crops than the plough, and the motor hoe is in the ascendancy in France, Bavaria and Austria.

An Adaptable Type

With experiments in mind which have been made in this country, and also in Germany in connection with an illumination scheme for night work in the field, it seems possible to sketch a type which gives more promise for the large majority of farmers, big or small, than any of the types exhibited at the Royal Show, and which, in addition, bids fair to interest automobile manufacturers greatly, for better or worse. This type means an equipment depending for power on the internal-combustion motor and on electric transmission for reaching the machines in the field.

The power unit may be the motor truck of general utility on the farm or an automobile otherwise used for personal transportation. This power unit itself would have electric drive. The generator would have connections not only to the electric vehicle motors but also to insulated feed wires wound upon one or two dismountable reels and terminating in properly safeguarded attachment plugs. The field units would be (1) a light four-wheeled carrier with swiveled front axle, two front driving wheels (with expansible rims and projecting tines, the tines being normally kept shorter in proportion as wheels were expanded to larger diameter, making higher gear, but susceptible of independent adjustment to allow one wheel to be made larger than the other, a differential gear compensating them, and completely retracted within wheel for road travel) and one or two electric motors to drive the tined wheels and also a main shaft arranged to be connected, when required, at different gear ratios to different tools; and (2) the agricultural tool of whatever kind, highly specialized for its work, to be attached as a plough or dropped into the carrier unit and connected—rigidly or flexibly, as the case might demand—to the main shaft just referred to at the gear ratio suitable for its work.

With the power unit remaining stationary, the feed wire or wires would be paid out from the reel or reels as the work-

ing units advanced over the soil and, having suitably swiveled attachments, would be rewound as the working units returned, the reels being of the largest practicable diameter to minimize wear of the wire insulation. A lasting and yet not bulky or heavy insulation would here be one of the few things yet to be devised.

Equipments somewhat of this nature—excepting little but the division of the field machine into a general electric tractor unit and the interchangeable mechanical soil or harvest tool—have been found suitable in their general features for agriculture as well as for lumbering in this country and in Canada, but have received little public mention. But the rapid growth in the demand for farm machines, as well as the prominence accorded to other types, now seems to call for all the mental energy that can be brought to bear to decide the question whether this type of equipment is not more adaptable to all kinds of soil and surface and to all kinds of work than any other, and especially than either the mechanical cable traction system or the universal tractor system. As it can be worked with a movable trolley wire, charged from the power unit (thereby avoiding the question of special insulating material), just as well as with a trailing feed wire, it is not limited to fields of small dimensions.

Perhaps it may prove a matter of the greatest importance in the choice of the type which shall predominate, that the millions of soldiers who will return to farms after the end of the European war will all be familiar with the erection of electric wire posts and with the careful handling of heavily charged wires.

The Urgency

The special interest of the electric equipment to the automobile industry, over and above any attaching to any other type that has been proposed, seems to be beyond doubt, since its general acceptance would involve the manufacture of farm automobiles and farm trucks on a plan suitable for making the power of such vehicles useful all the year round and almost all the time, thereby adding to their value and the universal demand for them. For the farmer it should be a valuable though subordinate advantage and convenience to be able to hang up an electric motor to drive a shaft at any place on his farm where power may be temporarily wanted, as for churning, milking, baling, conveying, pumping, etc., and to arrange readily for electric lighting in house, barn or field.

The North Adjustable Cantilever Spring

Editor THE AUTOMOBILE:—Perhaps you will allow me, as the inventor of the Adjustable Cantilever Spring described in your issue of June 1, to reply to your Reviewer's criticisms of the mathematical treatment of the design.

Mr. Krarup appears to object to my considering the spring as two separate portions. I would point out to him that though the fulcrum may be moved during the process of adjustment from the position above *B* toward *D* the clip remains attached to the *same* point on the spring. The only source of error in the assumption that I have made lies in the fact that it is impossible to estimate accurately the exact effect on the portion of the leaves embraced by the clip, of the pressure of the gripping wedges or set screws.

I remember seeing a fairly elaborate discussion of the effect of buckles or clips on the theoretical deflection of the spring, in the American automobile press some time ago. In my experience, the effect of such a clip as shown is to make the spring about 2 per cent stiffer than it would be if the clip were replaced by a single bearing point. This was specifically mentioned in the article, and it is only in this respect that the mathematical treatment given is based on approximation. As a matter of fact, every spring that has been made with my adjustment has given deflections which agree with the calculated deflections within 5 per cent, for all positions of the adjustment, and considering that this variation includes that caused by inaccuracy of the thickness of the leaves I consider that result proves in a practical way that my mathematical reasoning is correct. If your Reviewer will bear in mind the point mentioned at the commencement of my letter, viz: that the clip is always attached to the same portion of the spring, he will see that my mathematical reasoning does not involve any unfounded assumptions, and is quite logical.

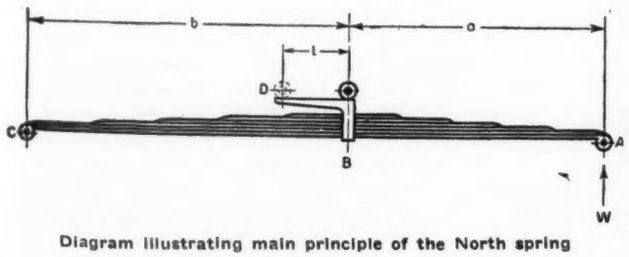


Diagram illustrating main principle of the North spring

The method of calculation of the deflection at the point *A* from the deflection at the point *C* is absolutely correct, as it is simply a question of taking the moments about the point *D* to obtain the displacement at *A* which a given deflection at *C* would cause. In this part of the calculation, it is merely a question of leverage and of relative movement. The fact that point *C* is anchored instead of being free to deflect makes not the slightest difference to the stresses and deflections of the spring itself, and I think that if Mr. Krarup takes the opportunity of looking further into my mathematics he will find that his criticism of my reasoning is unjust and unfounded. If he can show me a simpler way of calculating these springs, I shall be only too pleased to learn from him, but I confidently assert that he cannot show me a more accurate method.

London, June 28, 1916. O. D. NORTH.

Mr. M. C. Krarup is agreed with Mr. North that the tests of his spring may testify to or toward the correctness of the mathematical demonstration. His objection was to accepting the mathematics in advance as in themselves convincing. In fact, he offered reasoning to the effect that the mathematics were superfluous for proving that the stresses arising in the spring must be acceptable, leaving in contest only the claim to accurate correspondence between the premises accepted for the mathematics and the physical realities of the spring. He cannot agree that it is self-evident that a stress transmitted from the free end to the anchored end, and there resulting in a certain flexure must cause an additional deflection of the free end in exact proportion to the leverages involved. He would expect the real deflections to fall somewhat short of those calculated in this manner. But he would accept tests showing that only 5 per cent of flexibility is lost. He would ask if such tests show the discrepancy not exceeding 5 per cent, mentioned by Mr. North, coming always on the side of reduced flexibility and whether the length of the front-end shackle influences the result. Such test results could then be incorporated in all cantilever spring mathematics, it seems.

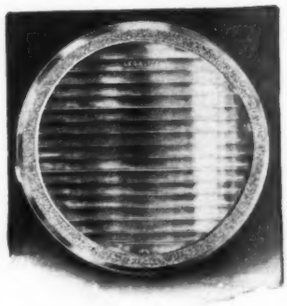
With regard to other points the reader is referred to THE AUTOMOBILE of June 1. All points specially mentioned in Mr. North's letter were understood then as now. Mr. K., however, wants to add his sincere thanks to Mr. North for his very interesting treatment of an opportune subject, and does not think that a little difference of opinion *as to when the mathematics of the case begin to become convincing* involves any injustice to Mr. North.

ACCESSORIES

K. P. Universal Rim Tool

DESIGNED for use on rims of the transversely split type, such as the Baker, Stanweld, Kelsey, Detroit, etc., this tool makes their operation both quick and easy. It locks the rim in a collapsed position while the tire is being removed or replaced, pulling the joint on the Baker type down and sideways to clear the valve stem and opening the joint on rims which, like the Kelsey, use an interlock. The manufacturers state that it does not slip, spring the rim out of shape or throw all the strain on one point of the rim, but gradually pulls it all the way around. Tube-pinching is impossible, as the tire slides easily over the rim without the use of forcing tools. In removing a flat tire from the rim jaw J is clamped 4 or 5 in. from the split end of the rim that is to be pulled under. Jaw J1 is then clamped as far from J as the handle of the tool will permit before striking the rim. With rims of the Stanweld type the joint is broken with the screwdriver and the handle pulled over to the position shown in the illustration, which locks the tool, freeing the tire. With the Baker type the handle is pulled sideways until the rim clears the valve stem and lugs. In replacing the tire and locking the rim the tool is capable of forcing the joint together, as is sometimes necessary when the bead of the tire is undersize. The tool is practically unbreakable, being made of cold-rolled steel, and weighs only 3 lb. It sells for $2.—K. P. Mfg. Co., 250 West Fifty-fourth Street, New York City.

K. P. Universal rim tool

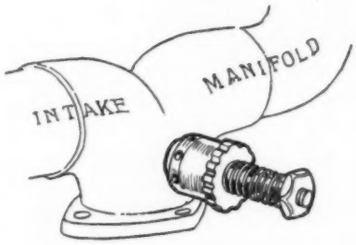

Legalite headlight lens

Cantilever Shock Absorbers

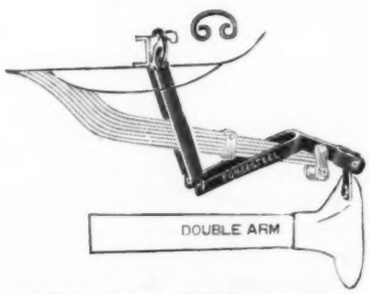
The Forgesteel cantilever shock absorber for Fords consists of a lever which takes the place of the spring shackle, to the end of which a long coil spring running to the frame is attached. A single lever set costs $8 and double lever, $10.—Home Light Co., 3353 Milwaukee Avenue, Chicago, Ill.

Right Gasoline Saver

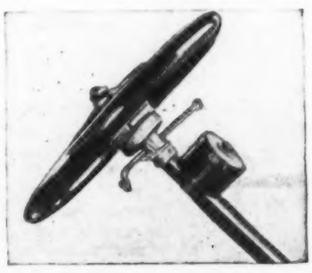
The Right gasoline saver is in principle an automatic relief valve that attaches to the manifold and admits additional air to the cylinders in greater or less amount, according to the speed and load of the engine. The air intake is controlled automatically and admits additional air to the cylinders only when the engine is not pulling hard—that is, when the car has attained the desired speed. The valve remains closed while the engine is accelerating, so that it does not decrease the power of the motor when increasing the speed or in going up hill. When properly adjusted it does not interfere with the idling of the engine, while also it will fit any manifold. The manufacturer guarantees a saving in fuel of 30 per cent, and says that in tests the device has shown a saving of more than 60 per cent. It can be installed in 30 min. It lists at $5.—Right Motor Specialties Co., Chicago, Ill.



Right gasoline saver



Cantilever shock absorbers for Fords


Post type Evenlite

Legalite Headlight Lens

The main principle of construction in the Legalite, which is a multiple-prism lens, is that the lens consists of several types of prisms. Because of this the light is not diffused, while no glare is possible, the beams being sent downward and ahead, shining across the entire width of the road. It has been shown by tests that the Legalite device throws a driving light from 250 to 500 ft. ahead, and yet the light is at no point more than 4½ ft. off the ground. It is stated that the lens, which replaces the ordinary headlight lens, gives 25 per cent more light than the latter. Up to 8½ in. diameter the Legalite sells for $2.50; 8½ to 10½ in., $3; 10½ to 11⅛ in., $4.—Legalite Corp., 117 Boylston Street, Boston, Mass.

Post Type Evenlite

This device is designed to give headlights of constant brilliancy on Ford cars regardless of speed. It is stated at 7 m.p.h. it gives five times the standard Ford light, at 10 miles, 3 times the standard, at 15 m.p.h., twice the standard and at 20 miles and over, it is constant regardless of engine speed. The post type requires less than 30 min. to install and is supplied with two lamps, clamps and screws as well as with necessary wiring. The hood type sells for $4 and the post type for $6.—St. Louis Electrical Works, St. Louis, Mo.

Schultze Tire Tool

This split rim tool can be adjusted to fit any rim, straight side or clincher, from 30 by 3½ to 36 by 4½ by altering the position of the thumbscrew in the adjusting holes in the cross member, which is in two parts. The expanding mechanism is a simple toggle joint which operates to open or close according to the lever motion. Price $2.50.—Schultze Machine Shop, Chenoa, Ill.

Repair Gears and Parts

Repair gears as well as various other parts such as driving shafts, differential cases, bearings, etc., for more than 100 makes of cars, are furnished by the Auto Gear & Parts Co. These parts are kept constantly in stock for immediate shipment.—Auto Gear & Parts Co., 1777 Broadway, New York City, 1461 South Michigan Avenue, Chicago, 275 Marietta Street, Atlanta, Ga.

The Automobile

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The South American Trade

IN the last 10 months South America has given our makers a taste of the possible ability of Argentina and parts of Brazil and other countries to purchase low-priced U. S. A. cars for farm use, a field hitherto very little exploited in these countries. The market is to-day a really appetizing one, but the question is, will it remain such after the termination of the war, when the time arrives that European countries can step back into the harness and pick up the reins of South American business that laid down on Aug. 1, 2 years ago.

Selling to the farmer in Argentina is in reality a new business, as the European car that dominated the South American field for nearly 20 years was largely sold in the cities. Europe has been watching with naturally covetous eyes the rapidly increasing sales of our cars in the country and reports from different countries suggest that after the war Europe may be much better fitted to compete with our low-priced cars than she was before the war. France is reported to be forming a $50,000,000 company to build low-priced machines on a great production scale. Some months ago reports leaked through from Germany that a similar project was under way there, and with the progress shown by England in various lines it would not be surprising if she, too, were engaged in like plans.

It seems certain that competition after the war will be keener than ever before and if the U. S. A. prices can continue to be much lower than European prices as in the past then there can be no doubt that our cheap cars will dominate the South American field as they are dominating other fields. But if Europe really meets us in price then we will be face to face with death-dealing competition because with our lack of U. S. A. ships and our poor exporting ability Europe can handle freight rates to suit its convenience and what advantages we gain by cheaper methods of manufacture, etc., will be offset on the freight question. There is at present sufficient difference in freight between Europe and South America as compared with U. S. A. and South America to indicate that with the war over, there would be a still greater difference. The U. S. A. ability to dominate the automobile market in South America will be very largely dependent on shipping rates. That is the only factor beyond the direct control of the automobile maker, and one that he must watch.

Farm Tractor Opportunity

THAT the sale of the modern type of small farm tractor is going to rest more or less with the automobile dealer has been indicated by the strong movement in their direction shown at the first tractor demonstration in Texas. Already many tractor makers have signed with large automobile distributors for large territories and more announcements of similar deals are being made every day. The tractor maker has been studying the dealer question carefully since last January, in fact before. At that time the tractor show in Kansas City was held the same week as the automobile show for the ostensible purpose of getting as many automobile dealers as possible to visit the tractor show. The object was partly accomplished, in fact, many automobile dealers signed for tractor territories at that time. Since then a vigorous campaign has been carried on and tractor makers have been keen students of the possibilities of the automobile dealer becoming the tractor dealer.

In our large agricultural areas the automobile dealer has for several seasons reported that he has been selling 75 to 95 per cent of his automobiles to the farmer. The automobile has been an unexpected asset to the farmer. He has been tied closer to the automobile dealer by the transaction and there is no more logical person to handle the tractor in our agricultural states than the up-to-date dealer.

Not all automobile dealers will be tractor dealers. Some are not qualified for the work. Some handle cars that do not suit the agricultural trade. Others are not adapted to handle the farm business. There will be many good implement dealers who will take their place in the tractor dealer field. The ultimate dealer of tractors is bound to be a compromise. But to-day the automobile dealer who has not looked into the tractor field for territory is overlooking a good opportunity. It is a certain business. The question for him to settle is, "Am I capable of handling the business?"

100,000 at Tractor Demonstrations

Oklahoma and Texas Farmers Crowd Into Dallas—Automobile Dealers Interested

By S. P. McMinn
Staff Correspondent

DALLAS, TEX., July 22—Demonstrating since Tuesday to interested crowds totalling over 100,000 and marked by many sales and even more agencies established, the first national tractor demonstration, participated in by nearly 100 machines representing some thirty manufacturers, came to a close here last night.

The farmers of Texas have flocked to the demonstration in numbers that have truly astounded those who expected a big attendance.

Car Dealers in Evidence

It is a significant fact that dealers and garagemen are taking such great interest in the demonstration. While manufacturers of tractors are plainly uneasy in their minds as to who ultimately will handle the tractor—automobile dealer or implement man—there seems no doubt but that the tractor maker will have to look to the garagemen for his service.

The demonstrations this year are being run in an entirely different manner from those of years gone by. The competitive spirit is entirely lacking and instead the whole affair is a demonstration in the purest sense of the word.

As an exhibition it is not unlike a great automobile show except that in every instance all the tractors are operating on gasoline and kerosene. Each exhibitor has a big tent; few of them have provided sawdust, and in each tent there is from one tractor to half a dozen.

Each day the machines are started running about 8 o'clock in the morning and few of them are stopped, except occasionally to replenish fuel, until 6 at night. Even during the plowing demonstrations the exhibition machines are permitted to run, often without attendance of any kind.

In this respect it is a tribute to their designers, that, in spite of the terrific heat, which during the first part of the week was as high as 103 deg., none of the machines evidenced any inclination to steam.

The public demonstration is started each day promptly at 1 p. m. At 12.15 all of the tractors leave their respective tents, and, towing the implements that will be demonstrated, make a great, noisy procession to the demonstration field, which is perhaps half a mile from the tents.

The demonstration is being held on what is known as the Caruth farm, a great tract of land giving about 1200 to 1500 acres on which to manipulate the tractors. Each tractor manufacturer has allotted to him each day a strip of land, the size of the strip being proportioned to the size of the tractor to be demonstrated and the number of plow bottoms it will pull.

Every tractor operator must start his machine at a given signal and continue to plow until all his land has been finished. This, of course, promotes some friendly rivalry between the various companies, but this is the only spirit of competition there is.

No restriction is placed on the kind of fuel employed. A maker may use either gasoline, kerosene or distillate, though up to to-day only one maker has been doing any plowing with the latter. But each maker must procure his fuel from a designated source, so that there may be no doubt of its gravity.

Most of the machines in use have been burning kerosene. On the first day, when there were some forty-four machines on the field at the same time, twenty-seven of them were operating on kerosene as against seventeen operating on gasoline.

The fuel problem does not appear to worry the farmer greatly in Texas. Gasoline is at present selling for 19 cents per gallon, but he can get kerosene from 7 to 10 cents. All manufacturers are taking kerosene into consideration.

During the week a large number of contracts have been signed and though few manufacturers care to make public the names of new dealers and distributers they have no hesitancy in saying that wherever it is possible they invariably prefer to do business with the automobile dealer or the garageman.

The accessory exhibit is one of the most interesting tents on the grounds. That there is a market and a big one for accessories there can be no doubt, for from the engine back to the transmission gear there is not a great deal of difference between the tractor and the automobile. Exhibitors:

TRACTOR EXHIBITORS

Waterloo Gasoline Engine Co., Waterloo, Iowa.—24 hp. kerosene; drawing one 10-ft., 10-disk harrow with one 10-ft. grain drill.

Standard - Detroit Tractor Co., Detroit—10-20 hp., gasoline, drawing one 4-gang Sanders disk plow.

Simplex Tractor Co., Minneapolis—10-20, gasoline, drawing one 4-gang La Crosse plow.

Rock Island Plow Co., Rock Island—10-20, gasoline, drawing one 4-gang Sanders disk plow.

Peoria Tractor Co., Peoria—8-20, kerosene, drawing one 4-gang Sanders disk plow.

Parrett Tractor Co., Chicago—12-25, gasoline, drawing one 4-gang Sanders disk plow.

Nilson Farm Machinery Co., Minneapolis—24-35, gasoline, drawing one 4-gang La Crosse plow.

Moline Plow Co., Moline—6-12, gasoline, drawing two 14-in. moldboard and two disk plows.

Twin City Tractor Co., Dallas—15-30, kerosene, drawing 6-gang Sanders disk, 40-60, kerosene, drawing 18-gang Sanders disk; 15-30, sub-soiler, drawing 32 12-in. spades and 3-gang Sanders disk plow.

Bates Tractor Co., Lansing—13-30, kerosene, drawing 4-gang Sanders disk plow.

International Harvester Co., Chicago—15-30, Titan kerosene, drawing 6-gang Sanders disk; 12-25, Mogul, kerosene, drawing 5-gang Sanders disk plow; 10-20, Titan, kerosene, drawing 4-gang Sanders disk plow; 8-16, Mogul, kerosene, drawing 3-gang Sanders disk plow; 8-16, Mogul, kerosene, drawing an Osborne disk harrow with tandem attachment; 10-20, Titan, kerosene, drawing two Kentucky 10 x 7 grain drills; 12-25, Mogul, kerosene, drawing 3 Webber wagons.

Holt Mfg. Co., Peoria, Ill.—25-45, gasoline, drawing 12-gang Sanders disk plow.

Happy Farmer Co., Minneapolis—8-16, gasoline, drawing 3-gang Sanders disk plow.

Hart-Parr Co., Charles City, Iowa—15-30, kerosene, drawing 3-gang La Crosse disk plow; 18-35, kerosene, drawing 8-gang La Crosse disk plow; 30-60, kerosene, drawing 10-gang La Crosse disk plow.

Emerson-Brantingham Co., Rockford, Ill.—12-20, Model L, kerosene, drawing 4-gang disk plow; 12-20, Model Q, drawing 4-gang disk plow; Big Four, 20, distillate, drawing 7-gang disk plow.

Denning Tractor Co., Cedar Rapids, Iowa—10-18, kerosene, drawing 3-gang Sanders disk plow; 10-18, kerosene, drawing John Deere pulverizer and harrow.

Sandusky Tractor Co., Dallas—15-35, kerosene, drawing 6-gang La Crosse disk plow.

J. I. Case T. M. Co., Racine—9-18, gasoline, drawing 3-gang Grand Detour disk plow; 10-20, kerosene, drawing 4-gang disk plow; 12-25, kerosene, drawing 6-gang disk plow; 20-40, kerosene, drawing 10-gang disk plow.

Wallis Tractor Co., Racine—26-44, gasoline, drawing 8-gang Case disk plow.

Bull Tractor Co., Minneapolis—7-20, gasoline, drawing 3-gang Sanders disk plow.

Avery Co., Peoria—5-10, kerosene, drawing 2-gang Grand Detour disk plow; 8-16, kerosene, drawing 4-gang John Deere disk plow; 12-25, kerosene, drawing 6-gang Rock Island plow; 18-36, kerosene, drawing 8-gang Rock Island disk plow; 25-50, kerosene, drawing 12-gang Rock Island plow.

Avery & Sons, B. F., Louisville—10-20, gasoline, drawing 2-gang Avery disk plow.

Allis-Chalmers Mfg. Co., Milwaukee—10-18, gasoline, drawing 3-gang John Deere plow.

Advance Rumely Thresher Co., La Porte—30-660, kerosene, drawing 14-gang Sanders disk plow; 15-30, kerosene, drawing 8-gang Sanders disk plow; 12-24, gasoline, drawing 3-gang moldboard plow.

Ford Tractor Sales Co., Minneapolis—8-16, gasoline, drawing 3-gang Sanders disk plow.

Standard Tractor Co.—22-24, gasoline, drawing 6-gang P. & O. disk plow.

Western Tractor Co., Dallas—8-15, gasoline, drawing 3-gang P. & O. disk plow.

ACCESSORY EXHIBITORS

Avisco Oil Co., L. Sonneborne & Sons, McQuay-Norris Mfg. Co., Pyrene Mfg. Co. of Texas, Gulf Refining Co, Eisemann Magneto Co., Hyatt Roller Bearing Co., Domestic Engineering Co., Sumter Electric Co., Kingston Electric Co., Byrne-Kingston Co.

Tractor Ratings Committee Appointed

WICHITA, KAN., July 23—The National Gas Engine Assn. has appointed a tractor ratings committee which will seek to standardize methods of rating farm tractors, both as to drawbar pull and belt horsepower. The drawbar rating favored is in pounds pull with the time element incorporated. The belt power will be in terms of horsepower. The committee will endeavor to evolve a method which will be satisfactory to all manufacturers.

Chairman of the committee is Raymond Olney, editor, *Gas Power*. Other members are: Fred Glover, vice-president, Emerson-Brantingham Implement Co.; C. M. Eason, Hyatt Roller Bearing Co.; G. T. Strite, president, Strite Tractor Co., and H. C. Buffington, chief engineer, Minneapolis Steel & Machinery Co.

Oakland Plans Big Expansion

New Buildings To Be Completed and Machinery Installed Oct. 1

PONTIAC, MICH., July 20—Announcement is made by the Oakland Motor Co., this city, that its plans for greatly expanding its plant have been officially approved by President W. C. Durant of the General Motors Co., and building operations will begin as soon as the buildings on the old Studebaker site have been removed.

In addition to the 4-acre site, formerly a part of the old Studebaker works, negotiations have just been completed for the annexation of the solid block extending from Oakland Avenue to Howard Street, fronting on Baldwin. The new buildings will be occupied by a machine shop and additional assembly departments.

Immediate expansion of the plant was imperative in order to bring the output up to a point which will meet the demand for Oakland cars.

Until the architects have completed detailed plans, it is impossible to accurately estimate the increase in floor-space the expansion gives, but it is said that the output will be materially increased and that it will ultimately employ double the present force of workmen. Work on the new buildings will be pushed to the limit, the contracts for the work calling for completion by Oct. 1, ready for the installation of machinery already purchased and en route.

At the close of business July 1, the Oakland company was several thousand cars ahead of the last fiscal year.

Detroiter Adds $1,098 Roadster

DETROIT, MICH., July 25—The Detroiter Motor Car Co., Detroit, which heretofore has manufactured a touring car only, now has added a roadster body to fit the same six-cylinder chassis, and priced at $1,098. The new roadster body adheres to strictly modern lines, with sloping hood and cowl, slanting windshield, and sloping rear deck. There is room for three passengers in the wide seat, and at the rear there is a large waterproof compartment for luggage or other articles. The new roadster is sold with option of colors, and is upholstered in leather to match.

Many Changes in New York Overland Organization

NEW YORK CITY, July 25—The Willys-Overland Co. as a result of taking over its own branch in this city and surrounding territory, has made many changes in its local organization.

E. M. Lied, formerly zone manager in this territory, has been appointed assistant manager of the local branch in the Circle Building, on Broadway and Fifty-ninth Street. H. F. Harris, formerly assistant manager of the L. Michael Co., Chicago, Ill., becomes comptroller.

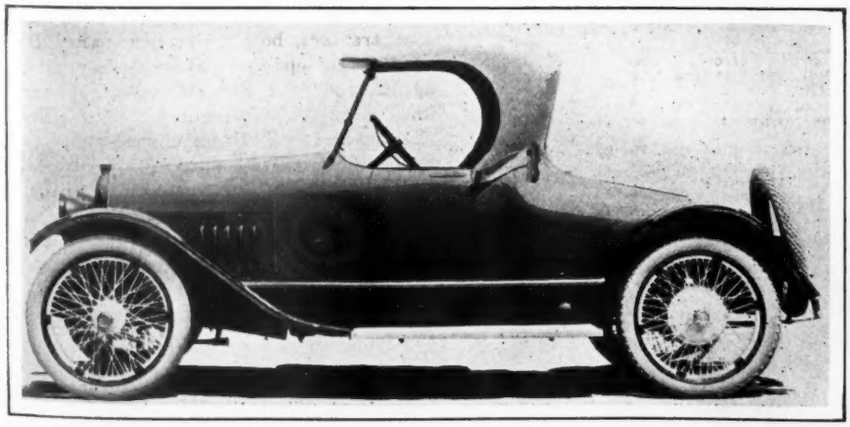
R. D. Willard, formerly manager of the Carl H. Page Co.'s branch in Philadelphia, has been appointed sales manager. S. D. Miller, also a member of the Carl H. Page Co., having managed the Brooklyn branch, joins the Overland forces as manager of the Newark, N. J. branch.

L. F. Seeback, formerly manager of the Brooklyn branch of the C. T. Silver Co., remains in that city as manager of the new Willys-Overland branch.

The Brooklyn branch is temporarily located at 338 Flatbush Avenue while the Newark branch is at 35-37 Halsey Street. The company expects to enlarge its territory by establishing branches in Yonkers and other nearby cities.

Fisher Body to Expand

DETROIT, MICH., July 22—To care for further expansion, the Fisher Body Co., body manufacturer, is preparing to float an issue of $5,000,000 of preferred stock through Hallgarten & Co., New York bankers.



New Detroiter 6-45 roadster which sells for $1,098, with complete equipment

Ford Co. Adds 34 Branches

New Quarters Planned in 28 Cities—Factory Closed for Inventory

DETROIT, MICH., July 20—The Ford Motor Co. marks an expansion of its branch sales and service organizations by the addition of thirty-four new branches, effective Aug. 1.

The cities selected for the Ford establishments are: Akron, Ohio; Albany, N. Y.; Troy, N. Y.; Baltimore, Md.; Birmingham, Ala.; Des Moines, Iowa; Duluth, Minn.; Fresno, Cal.; Grand Rapids, Mich.; Havana, Cuba; New Orleans, La.; Oakland, Cal.; Peoria, Ill.; Richmond, Va.; Rochester, N. Y.; Sacramento, Cal.; St. Joseph, Mo.; Salt Lake City, Utah; San Antonio, Tex.; Scranton, Pa.; Sioux City, Iowa; Spokane, Wash.; Springfield, Mass.; Tacoma, Wash.; Toledo, Ohio; Trenton, N. J.; Worcester, Mass., and Youngstown, Ohio.

With the establishment of these new branches the total number reaches eighty-five, besides the twenty-eight branch factories.

DETROIT, MICH., July 20—Notices are being given out to the workmen of the Ford Motor Co. whereby most of the 30,000 employed in the Detroit factories will not be required to be at work from July 25 to Aug. 7, during which period a complete inventory of property valued at approximately $100,000,000 will be taken. Ford's fiscal year ends July 31.

Two New Buildings for Monroe Body—Capital Increased

PONTIAC, MICH., July 20—Work is about to begin on two new buildings for the Monroe Body Co., an office building and a pressed steel plant. The office building is to be located on the west side of Osmun Street, and will be a brick structure 28 by 56 ft., and one story high. The new factory building will be located in the rear of the office building, fronting on the Michigan Air Line tracks a distance of 156 ft. The greatest depth will be 82 ft.

The capital stock of the Monroe company has been increased to $150,000.

Golde Top to Enlarge

NEW YORK CITY, July 25—The Golde Patent Mfg. Co., this city, will rent additional factory space in order to double its manufacturing facilities during the coming year. Besides the premises which it now occupies at 509-515 West Fifty-sixth Street, it has rented about 10,000 sq. ft. in an adjoining building 512-515 West Fifty-seventh Street. During the last 18 months this company has turned out over 89,000 one-man tops.

Comparative Statement of Packard Motor Car Co. Covering the Period from 1909 to 1917

	Capital Stock Issued			Net Assets	Earnings
	Common	Preferred	Total		
Sept. 1, 1909	$5,000,000	$5,000,000	$10,000,000	$10,766,847.65	.....
Year 1909-1910	5,000,000	5,000,000	10,000,000	12,819,799.23	$2,612,774.08
" 1910-1911	5,000,000	5,000,000	10,000,000	14,079,741.98	1,609,942.75
" 1911-1912	5,000,000	5,000,000	10,000,000	12,523,432.84	2,068,648.75 (2)
" 1912-1913	5,000,000	5,000,000	10,000,000	14,538,000.86	2,364,568.02
" 1913-1914	7,065,300	5,000,000	12,065,300	15,414,355.02	1,161,054.16
" 1914-1915	7,065,300	5,000,000	12,065,300	17,833,873.87	2,769,518.85
" 1915-1916 (1)	11,656,930	8,000,000	19,656,930	26,003,274.12	6,050,000.00
Totals	.....	.....	.....	.....	$18,636,506.61 (3)

	Common Dividends		Common Dividends		Preferred Dividends		
	Rate Paid	In Stock	Annual Rate	In Cash	Annual Rate	In Cash	Surplus Balance
Sept. 1, 1909	....	.....	...	.....	...	.....	$766,847.65
Year 1909-1910	....	.....	8%	$298,572.00	7%	$261,250.50	2,819,799.23
" 1910-1911	....	.....	...	.....	7%	350,000.00	4,079,741.98
" 1911-1912	....	.....	...	.....	7%	350,000.00	2,523,432.84 (2)
" 1912-1913	....	.....	...	.....	7%	350,000.00	4,538,000.86
" 1913-1914	40%	$2,000,000.00	...	.....	7%	350,000.00	3,349,055.02
" 1914-1915	....	.....	...	.....	7%	350,000.00	5,768,573.87
" 1915-1916 (1)	60%	4,591,630.00	7%	395,599.75	7%	455,000.00	6,376,344.12 (3)
Totals		$6,591,630.00		$694,171.75		$2,466,250.50	.....

(1) 9 months actual; 3 months estimated. (2) After writing down rights, privileges, etc., from $3,274,958.89 to $1; (3) After deducting depreciation for these 7 years of over $9,000,000.

Packard in 7 Years Earns $18,636,506

—

Over $9,000,000 Charged Off for Depreciation—$6,050,000 Expected During Fiscal Year.

DETROIT, MICH., July 23—In a comparative statement of its capitalization, net worth, dividends and surplus for the 7 years beginning Sept. 1, 1909 and ending at the close of the current fiscal year on Aug. 31, 1916, the Packard Motor Car Co. shows aggregate earnings of $18,636,506 after deducting more than $9,000,000 for depreciation during this 7-year period. The earnings for the present fiscal year, 9 months of which are based on actual figures and the last 3 months estimated, amount to $6,050,000 as compared with $2,769,518 for the year 1914 to 1915, which was the best previous earnings for the company. In offering this statement, F. R. Robinson, comptroller of the company, points out that the figures for the fiscal year—1915 to 1916—contain a conservative estimate covering the last quarter of the year and after paying regular preferred and common cash dividend and deducting the 10 per cent common stock dividend declared Feb. 1, 1916, and the 50 per cent common stock dividend to be distributed Aug. 1, the balance in the surplus account the end of the year will undoubtedly exceed $6,376,344. In the 7 years the capital stock of the company has been increased from $5,000,000 common and $5,000,000 preferred to $11,656,930, common stock and $8,000,000 preferred. In the same period the net assets have increased from $10,766,847 to $26,003,274.

The comparative statement by fiscal years appears herewith:

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Crude Oil Prices Drop

NEW YORK CITY, July 26—The most important event in last week's market report was the drop of 10 cents a barrel of Kansas crude petroleum. Announcement was made yesterday by the Prairie Oil and Gas Co., Tulsa, Okla., that it had reduced the price to $1.45 a barrel.

Supplementing the drop in crude petroleum comes the announcement of a reduction in price of linseed and lard oils. The former product is selling now at 69 cents a gallon, and the latter at $1.05.

Rubber prices were unsteady at the closing on Saturday. Prices on fine upriver Para, however, managed to remain unchanged at 66 cents a pound. Ceylon, first latex grade, suffered a drop of 2 cents a pound, the quoting yesterday being 56 cents.

Metal prices remained constant and strong with a heavy demand.

Daily Market Reports for the Past Week

Material	Tues.	Wed.	Thur.	Fri.	Sat.	Mon.	Week's Ch'ge
Aluminum, lb	.58	.58	.58	.58	.58	.58	...
Antimony, lb	.14½	.14½	.14½	.14½	.14½	.13	— .01½
Beams and Channels, 100 lb	2.67	2.67	2.67	2.67	2.67	2.67	...
Bessemer Steel, ton	40.00	40.00	40.00	40.00	40.00	40.00	...
Copper, Elec., lb	.26½	.26½	.26½	.26½	.26½	.26½	...
Copper, Lake, lb	.26½	.26½	.26½	.26½	.26½	.26½	...
Cottonseed Oil, bbl	9.95	9.65	9.65	9.60	9.52	9.45	— .50
Fish Oil, Menhaden, Brown, gal	.55	.55	.55	.55	.55	.55	...
Gasoline, Auto, bbl	.24	.24	.24	.24	.24	.24	...
Lard Oil, prime, gal	1.10	1.10	1.10	1.10	1.10	1.05	— .05
Lead, 100 lb	6.30	6.30	6.30	6.35	6.35	6.35	+ .05
Linseed Oil, gal	.70	.70	.70	.70	.70	.69	— .01
Open-Hearth Steel, ton	42.00	42.00	42.00	42.00	42.00	42.00	...
Petroleum, bbl., Kans., crude	1.55	1.55	1.55	1.55	1.55	1.45	— .10
Petroleum, bbl., Pa., crude	2.60	2.60	2.60	2.60	2.60	2.60	...
Rapeseed Oil, refined, gal	.92	.92	.92	.92	.92	.92	...
Rubber, Fine Up-River Para, lb	.66	.66	.66	.66	.66	.66	...
Ruober, Ceylon, First Latex, lb	.58	.58	.58	.57	.57	.56	— .02
Sulphuric Acid, 60 Baume, gal	3.00	3.00	3.00	3.00	3.00	3.00	...
Tin, 100 lb	37.50	37.13	37.50	37.70	38.00	38.25	+ .75
Tire Scrap, lb	.05¾	.05¾	.05¾	.05¾	.05¾	.05½	—. 00¼

$1,275,000 Profit for Stewart-Warner

—

Earnings Based on 6 Months' Operations — Declares Quarterly Dividend of 1½ Per Cent.

CHICAGO, ILL., July 20—The Stewart-Warner Speedometer Co. has declared the regular quarterly dividend of 1½ per cent on the common stock, payable Aug. 1 to stock of record July 22.

The corporation reports for the 6 months ending June 30 last net profits of $1,275,000, a new high record. The net profits in the last quarter totaled $703,254, against $571,873 in the first quarter of the calendar year.

The balance sheet shows assets as follows: Real estate, buildings, machinery, etc., less depreciation, $1,720,774; patents, trade marks, and good will, $9,096,967; inventories and receivables, $3,454,008; deferred charges $154,158; total assets, $14,425,908.

Liabilities: Preferred stock $724,400; common stock $10,000,000; current liabilities $420,317; surplus $3,281,191. Surplus includes $307,463 set aside to retire the preferred stock.

—

Sewell Cushion Increases 300 Per Cent

DETROIT, MICH., July 20—The Sewell Cushion Wheel Co., this city, shows an increase in business for the first quarter of its fiscal year of 300 per cent over the same period last year.

Plans are now being formulated for establishing service stations, in connection with the branches in Buffalo, Boston, New York City, Philadelphia, Baltimore, Minneapolis, Rochester, Cleveland, St. Louis, Pittsburgh, Los Angeles, Seattle, and Chicago. A service station is maintained at the factory for the benefit of Detroit users.

—

Murray Parts Increases Capital

DETROIT, MICH., July 25—The J. W. Murray Mfg. Co., this city, maker of au-

tomobile parts, has increased its capital from $200,000 to $500,000. $250,000 of this amount is subscribed, the greater portion of which will be paid in by the declaration of a 100 per cent stock dividend, the balance being taken by the directors.

To take care of its increased business, the company has also recently invested in 3½ acres of additional property and a factory, at an outlay of $175,000. This will serve to double its capacity, as all the original plants will still continue to be operated, and will afford in all over 150,000 sq. ft. of floorspace.

—

Burdick and Hagerman Now Control Central Wheel

STURGIS, MICH., July 20—A deal was consummated to-day whereby F. L. Burdick and Roy H. Hagerman have purchased the controlling interest in the Central Wheel & Mfg. Co. The purchase was made from Mrs. Emma Westendorf, formerly vice-president. The company was organized in 1909, and its products include wheels of all sorts.

—

Wichita Falls Plans to Expand

WICHITA FALLS, TEX., July 24—The Wichita Falls Motor Co. has increased its capital stock from $100,000 to $400,000. It has met with much success in manufacturing motor trucks at its plant here and it is stated that it plans to greatly enlarge the industry.

Securities in Demand

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Chevrolet and Maxwell Feature Rise in Prices—Stocks Are Strong

NEW YORK CITY, July 26—Automobile securities showed pronounced strength last week and picked up somewhat in prices. Rumors of further mergers and dividend action had their potent effect on the market in general and prices rose as a result of the demand in those stocks so affected. The market as a whole was steadier than last week and stocks were in demand.

Chevrolet and Maxwell featured the market with rises of 22 points and 7⅜ points, respectively. Dame Rumor has it that Chevrolet common is due for a large dividend and as a result it is expected that the stock will reach a new high mark before the next month is over. Maxwell rose as a result of the belief that the directors of that company will place the common stock on a dividend basis at their meeting on Aug. 8. This stock was one of the most active of the motor stocks, the turnover on Saturday being 5400 shares. It is expected that if the common stock dividend is declared that the second preferred will come in for an initial dividend.

The new Stromberg and Kelsey Wheel stock was introduced on the Curb last week. The former sold at $42, $42.25 and $42.50, the sales amounting to 1800 shares. Kelsey Wheel common advanced from 60 to 63 after its introduction. Stewart-Warner Speedometer common, it is stated, will be listed on the New York and Chicago stock exchanges.

Stutz stock was one of the strongest issues on the curb Saturday due to rumors of a merger of that company with Stromberg. Both of these companies are now under control of Allan A. Ryan & Co., this city.

—

Wayne Oil Increases Capital $200,000

FORT WAYNE, IND., July 25—The Wayne Oil Tank & Pump Co., this city, has increased its capital from $500,000 to $700,000. The object of the increase is to provide for big additions to the plant to take care of the concern's rapidly expanding business. Among the improvements will be the construction of a factory building nearly 400 ft. long.

—

Reports $13,000 in Krit Assets

DETROIT, MICH., July 22—Final reports in the case of the Krit Motor Sales Co., the bankrupt selling organization for Krit cars, were filed in the United States district court here this week, and show approximately $13,000 of the company's assets remaining on hand. The total receipts for the sale of the property were $81,126 and the total disbursements $67,883, of the latter $65,047 representing dividends to creditors amounting to 37½ per cent. Indications are that another dividend of about 4 per cent will be declared.

Automobile Securities Quotations on the New York and Detroit Exchanges

	1915 Bid	1915 Asked	1916 Bid	1916 Asked	Wk's Ch'ge
Ajax Rubber Co. (new)	..	..	64	65	+ ½
J. I. Case pfd	70	79	83½	89	+1½
Chalmers Motor Co. com	89	92	175	180	+10
Chalmers Motor Co. pfd	95	98	98	103	..
*Chandler Motor Car Co	..	..	107½	108	+4
Chevrolet Motor Co	..	..	216	218	+22
Fisk Rubber Co. com	..	..	..	160	..
Fisk Rubber Co. 1st pfd	..	..	114	120	+2
Fisk Rubber Co. 2d pfd	..	..	120	..	+8
Firestone Tire & Rubber Co. com	506	512	915	930	..
Firestone Tire & Rubber Co. pfd	109	111	111	115	+1½
*General Motors Co. com	179½	181	480	530	—5
*General Motors Co. pfd	105	107	110⅛	114⅞	+ ⅝
*B. F. Goodrich com	50	51	73⅛	73½	+ ¼
*B. F. Goodrich pfd	104½	106	113	115	— ½
Goodyear Tire & Rubber com	269	272	225	228	+2
Goodyear Tire & Rubber pfd	105	106½	106	106¾	..
Grant Motor Car Co	..	..	9	11	..
Hupp Motor com	..	..	6½	7	— ½
Hupp Motor pfd	..	..	80	100	..
International Motor Co. com	17	19	5	10	—2
International Motor Co. pfd	40	44	17	25	—1
*Kelly-Springfield Tire & Rub. com	165	168	70¼	71	+1¾
*Kelly-Springfield Tire & Rub. 1st pfd	86	87	96	97½	+1
Kelsey Wheel com	..	..	60	63½	..
Kelsey Wheel pfd	..	..	100¼	101	..
*Lee Rubber & Tire Corp	..	..	45	45½	+2½
*Maxwell Motor Co. com	35½	37	81⅛	81½	+7¾
*Maxwell Motor Co. 1st pfd	84	86¾	87½	87¾	+3¾
*Maxwell Motor Co. 2d pfd	31	33	57¾	58¼	+3¼
Miller Rubber Co. com	196	199	200	215	..
Miller Rubber Co. pfd	94	96	104	106	..
Packard Motor Car Co. com	110	115	168	173	..
Packard Motor Car Co. pfd	97	..	100	105	..
Paige-Detroit Motor Car	..	..	45	50	..
Peerless Truck & Motor Corp	..	..	23	25	+1
Perlman Rim Corp	..	..	..	..	..
Portage Rubber Co. com	36	38½	113	115½	..
Portage Rubber Co. pfd	92	95	115	117	..
Regal Motor Co. pfd	..	..	17	20	..
Reo Motor Truck Co	15½	..	37¼	37¾	+1
Reo Motor Car Co	30	31	43½	44	+1
Saxon Motor Car Co	..	..	75	78	+2
Springfield Body	..	..	77	78	..
Standard Motor Co	..	..	5	6	..
Stewart-Warner Speed. com	65½	66½	103	105	+5
Stewart-Warner Speed, pfd	105	107	..	..	..
Stromberg Motor	..	..	42	42¼	..
*Studebaker Corp. com	81½	83	126½	126¾	+1⅞
*Studebaker Corp. pfd	99	101	109	111	..
Stutz Motor	..	..	62¾	63	+2¾
Swinehart Tire & Rubber Co	77	78	85	87	..
United Motor Corp	..	..	69	69¼	+3⅝
*U. S. Rubber Co. com	43½	45	53⅜	53⅞	+1⅛
*U. S. Rubber Co. pfd	102	104	108	109	+ ¼
White Motor Co (new)	99	103	54	54¼	+1½
*Willys-Overland Co. com	132	133½	60½	60⅝	—3¾
*Willys-Overland Co. pfd	102	103¾	105⅝	106	+ ⅝

*At close July 24, 1916. Listed New York Stock Exchange Quotations furnished by John Burnham & Co.

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

ACTIVE STOCKS

	1915 Bid	1915 Asked	1916 Bid	1916 Asked	Wk's Ch'ge
Auto Body Co	..	..	..	..	..
Chalmers Motor Co. com	..	91	172	..	..
Chalmers Motor Co. pfd	94½	97	..	103	..
Continental Motor Co. com	205	..	35¼	36½	..
Continental Motor Co. pfd	82	86	9½	10½	..
Ford Motor Co. of Canada	1475	..	337½	352	..
General Motors Co. com	178	183	470	510	—10
General Motors Co. pfd	105½	107½	..	111½	..
Maxwell Motor Co. com	35½	37½	75½	78½	+2
Maxwell Motor Co. 1st pfd	82½	84½	84	87	+1
Maxwell Motor Co. 2d pfd	31½	34	55	59	+2
Packard Motor Car Co. com	110	115	..	176	..
Packard Motor Car Co. pfd	98	100¼	..	104	..
Paige-Detroit Motor Car Co	..	..	44	50	..
W. K. Prudden Co	19½	21	44	46	..
Reo Motor Car Co	30¼	31½	43¼	44¼	+ ⅝
Reo Motor Truck Co	17	..	37	38	..
Studebaker Corp. com	81½	83½	126	129	+1
Studebaker Corp. pfd	99	101	105	..	..
C. M. Hall Lamp Co	..	..	..	32	..

INACTIVE STOCKS

Atlas Drop Forge Co	..	26	..	40	..
Kelsey Wheel Co	205	..	450	..	..
Regal Motor Car Co. pfd	15	25	17	..	..

Left—Doane truck crossing frail bridge with 12,000-lb. load in Panama-California Exposition Commercial Vehicle run, Los Angeles to San Diego, July 14 and 15. Right—Trucks checking in at San Juan Capistrano, the first day noon control

Plan Another Desert Race

Course from Los Angeles to Salt Lake Over Arrowhead Trail

SAN BERNARDINO, CAL., July 19—There is to be a desert road race staged in the Southwest this fall which will not be a revival of the Phoenix road race. There is to be a race from Los Angeles to Salt Lake over the Arrowhead Trail, a road that cuts in on the National Old Trails route between this city and Needles.

Charles Biglow, field secretary of the Arrowhead Trail Assn., which is promoting the event, was in Los Angeles yesterday for a conference with Al. G. Waddell, representative of the contest board of the A. A. A. and a car is going out to pathfind the route within the next few days. The dates asked for by the Arrowhead Trail Assn. are Oct. 8, 9 and 10. The race is to finish at Salt Lake at at noon of the third day, Oct. 10, which is the opening day of the Mormon Conference. One night control is to be at Ely, Nev., and the second is to be at St. George, Utah.

From St. George into Salt Lake, the cars are to be limited to a safe pace on account of the great number of children in the country through which the Utah State highway passes.

It is planned to have a large enough purse to offer $5,000 first money. The Salt Lake Railroad is to run the "Howdy Special," which was always a feature of the Phoenix races.

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Eleven Perfect Scores in Truck Reliability Run

EXPOSITION GROUNDS, SAN DIEGO, CAL., July 20—Eleven out of fourteen trucks entered in the commercial vehicle reliability run of 150 miles from San Diego to Los Angeles on July 15, finished with perfect scores. The run was over the worst highways of southern California.

The trucks ranged from 1000 to 12,000 lb. capacity. Those that were penalized had minor troubles.

The following list gives the truck, the name of the driver and the load carried:

Truck and Driver.	Load Carried
Vim, Krapp	1,100
Vim, Kirkpatrick	1,100
Vim, Lloyd	1,200
Downe, Miller	12,000
Stewart, Fouch	1,030
Studebaker, Futley	1,090
Studebaker, Fortine	2,121
Smith Form A Truck, Meisel	2,090
G. M. C., Hurd	7,400
Denby, H. G. Pendell	3,010
Little Giant, Darin	1,590
Little Giant, Johnson	3,130
Autocar, Heffner	3,150
G. M. C., Burris	1,670

Another truck reliability tour is planned. The Motor Truck Dealers' Assn. of Los Angeles has made application to the Contest Board of the A. A. A. for a sanction for a run Oct. 22 and 23. This run would be approximately 400 miles and the course would include every road condition.

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Accidents Mar Tacoma Races

TACOMA, WASH., July 23—*Special Telegram*—Ulysses Aubrey, driving a Tacoma special and his mechanician, Frank Lake, were instantly killed in the Australian pursuit race on the Rose City Speedway to-day. A series of accidents marred a good race program with record attendance. F. M. Penticost, driving the Schnieder Special, went through the fence but was unhurt. M. J. Moosie of Los Angeles, in the Gandy special, plunged 300 yd. and his car jumped 22 ft. in the air with a broken steering knuckle. The 50-mile race was won by Omar Toft of Los Angeles, time 49 min. 27 2/5 sec. The 20-mile race also was won by Toft in 20 min., 29 1/5 sec.

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Sealand Resigns from Winton

DETROIT, MICH., July 21—F. A. Sealand, manager of the Detroit branch of the Winton Motor Car Co. for the last 4½ years, has resigned to become general manager for T. H. Towle, proprietor of the Cleveland-Cadillac Co., the Columbus-Cadillac Co., and the Toledo-Cadillac Co.

De Palma Wins at Kansas City

Takes 100-Mile Race at 58.48 M. P. H.—O'Donnell Injured in 25-Mile

Winners of 100-Mile Race

Car	Driver	Time	M.P.H.	Prize
Mercedes	DePalma.	1:42:54	58.4	$2,500
Duesenberg	O'Donnell.	1:45:6	57.02	1,000
Duesenberg.	Buzane...	1:49:42	54.6	600
Kleinart.....	Klein ...	1:54:56	53.1	400

KANSAS CITY, MO., July 22—Marred by only one accident, an injury to Eddie O'Donnell, the daring Duesenberg driver, Kansas City has at last held a successful speedway meet. O'Donnell will be out of the hospital in 2 weeks.

Ten thousand enthusiastic Kansas Cityans this afternoon saw Ralph de Palma in his cream-colored Mercedes win the 100-mile grind after a thrilling contest with O'Donnell. The Italian's time was 1:42:54, or an average of 58.48 m.p.h.

After cheering O'Donnell to the echo for his game fight against the veteran De Palma, the crowd saw the clever little driver hurtle through the fence on the first turn of the track in a 25-mile event which followed the first race. He was badly hurt but his mechanician was unhurt. A broken steering knuckle caused the accident.

Before the 100-mile race had been half finished the 1⅛-mile dirt speedway became so full of ruts and wallows that it became necessary to shut off the power entirely at some places. The strain on the cars was so terrific that only five out of twelve starters finished, although there were six money prizes. The terrible condition of the course had something to do with the fact that less than half the starters finished the first race. De Palma, after winning the first event, refused to enter the second, which had been originally scheduled to go 50 miles but was cut down to 25.

De Palma drove his usual steady pace, stopping only twice at the pits, once to replace broken goggles and the second time to change a tire.

Eddie Rickenbacher's Maxwell led the field until the thirty-second lap, setting a hot pace. Up to the time he was forced to quit because of a broken water connection he had averaged 66.77 m.p.h. When Rickenbacher relinquished the lead to O'Donnell, the Duesenberg driver maintained first place until the sixty-sixth lap, when De Palma took it from him in a sharp brush in front of the grandstand.

Second Race Unfinished

A bad accident was narrowly averted because Burt stopped his Ogren car at the pit just before his rear axle, which had been cracked, became dangerous. He was third in the race at this time.

The second race never was finished, the only two contestants being left on the course after O'Donnell's accident being flagged down at the end of the fourteenth lap. W. W. Brown, driving a DeChesneau, who was leading at that time probably will be given first money, however, $600. Art Johnson who was also on the course in a Crawford probably will be awarded second prize, $400.

The speedway association plans strengthening the track and holding a meet Oct. 7, the last day of the American Royal Live Stock Show.

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King and Winterson Join Chalmers

DETROIT, MICH., July 24—C. H. King and J. P. Winterson have been added to the sales staff of the Chalmers Motor Co. Mr. King has been connected with the automobile field since 1905, having been with such companies as the Motor Car Sales Co., New York City and the H. L. Keats Auto Co., agent for the Chalmers in 1907 at Portland, Ore. Mr. Winterson was connected several years ago as a member of the Lozier staff in New York City. Later he joined the Chandler organization.

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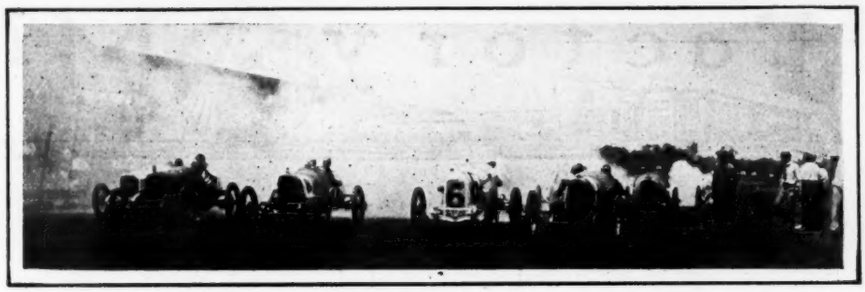
Backus Ford's Baltimore Mgr.

BALTIMORE, MD., July 20—E. T. Backus has been appointed manager of the branch of the Ford Motor Co. in Baltimore, Md., which will be opened Aug. 1.



Start of the 100-mile race on the Kansas City speedway. This event was won by De Palma in his Mercedes with O'Donnell's Duesenberg second

Saxon Relay Breaks Record

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43 Sixes Relay from New York to Frisco in 6 Days, 18 Hr. and 10 Min.

DETROIT, MICH., July 22—Forty-three Saxon six automobiles, racing in relays, established a new transcontinental record when the last car reached San Francisco precisely at 4.40 Saturday morning, 6 days, 18 hr. and 10 min. after leaving New York City.

This record from coast to coast was made carrying a message from Mayor Mitchel, of New York to Mayor Rolf of San Francisco, over the proposed Lincoln Highway route.

An official observer started with the first Saxon car at 10.26 a. m. Saturday, July 15, and went the entire distance by changing from car to car as the relay progressed. The cars were driven by regular Saxon dealers and while the official mileage of the Lincoln Highway is 3,331 miles, it is stated that the total distance traversed was considerably more than this, due to detours, etc. The Saxons averaged about 25 m.p.h. for the entire distance. Forty-two changes from car to car were made.

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Rubber Interests on Outing

BOSTON, MASS., July 20—The 17th annual outing of the Rubber Club of America was held on July 17 and 18, taking in places and events of interest in both Boston and Lowell.

A large delegation of western men, headed by H. S. Firestone, president of the club, P. W. Litchfield of the Goodyear company, C. B. Raymond, secretary of the Goodrich company, and W. O. Rutherford of the Goodrich company, as chairman of the western delegation arrived here to-day.

The last day was devoted to match plays at golf, tennis, baseball, etc.

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Minneapolis Speedway Suspended

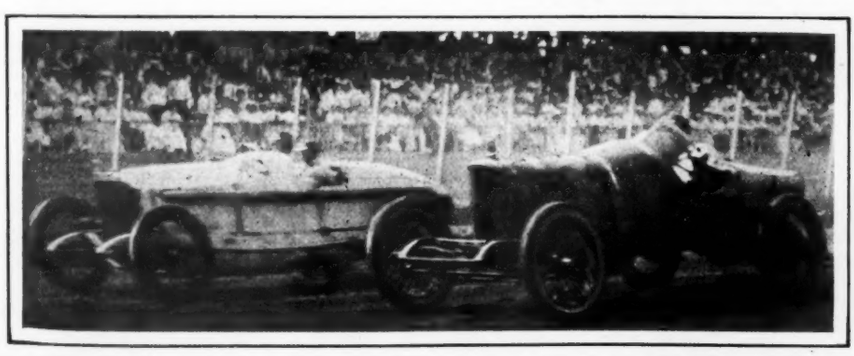
NEW YORK, July 25—The track license of the Minneapolis speedway which was opened scarcely a year ago was withdrawn by the Contest Board of the A. A. A. to-day, due to certain difficulties that arose in connection with the meet there on July 4, when the prize money was not posted and when the drivers had to take $6,800 instead of $20,000 as advertised in the entry blanks. J. F. Sperry, manager of the track has been suspended for 2 years for difficulties in connection with the meet, which was a fiasco.

Because of the small attendance at the Sioux City races on July 4, when the drivers' prizes were 50 per cent of the gate receipts and when the drivers were not adequately reimbursed for their expenses, the board voted not to grant any future sanctions where cash prizes are a percentage of gate receipts. In such cases the drivers have little chance of perhaps even paying expenses.

Indianapolis speedway has applied for a sanction on Sept. 9 for a championship 100-mile event, the prize being $900. Shorter events may also be listed.

Two competition records were allowed, both to Dario Resta in the Chicago race of June 18. The 50-mile mark allowed is 31:57 2/5 as compared with the old mark of 33:55.42. The other mark was at 10 miles, the time being 5:51 1/5, as compared with the old mark of 6:35.52.

For not advertising one of its speedway performances in accordance with A. A. A. rules the Hudson Motor Car Co., Detroit, was fined $1,000 with the option of disqualification until Jan. 1, 1917. This was in connection with races on the Chicago speedway, June 17.



De Palma taking the lead away from O'Donnell in the 100-mile race on the Kansas City speedway. The brush occurred on the grandstand stretch

Factory Miscellany

To Make Parts—The L. O. Gordon Mfg. Co., Muskegon, Mich., has been formed by a syndicate of Cleveland and Muskegon capitalists to manufacture automobile parts. The erection of a plant to cost $100,000 will begin at once.

National Rubber Buys Land—The National Rubber Co., Pottstown, Pa., has purchased additional land on which it will erect a large factory.

Allen to Add—The Allen Motor Co., Bucyrus, Ohio, has broken ground for the erection of a large addition to its motor and transmission plant.

Clyde Truck Breaks Ground—The Clyde Motor Truck Co. has secured a tract of 40 acres at Farmingdale, L. I., and plans are now about complete for the breaking of ground for the erection of its factory buildings there.

New Tire Plant for Cuyahoga Falls—A new tire plant will shortly be opened in Cuyahoga Falls, Ohio, in the old factory building recently vacated by the Falls Rubber Co., and purchased by the new company. The new concern is backed by Akron capitalists and is incorporated at $25,000 and will be known as the Supreme Rubber Co. Daniel Zeistof of that city, formerly connected with the Marathon Rubber Co., will be general manager. The building will be ready for work in about three weeks.

Firestone Factory Picnic July 29—The Firestone Tire & Rubber Co., Akron, Ohio, will hold its annual picnic on July 29 at Silver Lake Park, near Akron. It is expected that during the course of the day and evening at least 25,000 people will be in attendance.

Maxim Silencer Uses Tent—The Maxim Silencer Co., Hartford, Conn., pending the completion of a new addition to the factory is making use of a tent for the welding department. The general offices have been removed from the factory to an adjacent dwelling, which is connected with the factory by a runway. Still another addition is being considered by the company.

New Departure Adds—An addition is to be made to the factory of the New Departure Co., Bristol, Conn., 300 ft. long and U-shaped. This will be known as the ball department when it is completed. The company has acquired considerable other ground for enlargement of the factory.

New Plant for Los Angeles—The latest manufacturing concern to enter the field in southern California is the Davis Manufacturing Co., which is located at 1238-44 South Flower Street, Los Angeles, Cal. The concern is manufacturing complete the Standard truck attachment and doing general machine work, making parts for any automobile or truck on the market.

Takes Over Top Co.—Continental Auto Top Mfg. Co., St. Louis, has taken over the plant and business of the Continental Auto Top Co. Arthur Leeser succeeds G. I. Juhlein as owner of the majority interest. The plant at 814-16-18 is being entirely overhauled. Automobile tops, jiffy curtains, seat coverings and commercial bodies are the output.

Miller Rubber Holds Outing—The thousands of employees of the Miller Rubber Co., Akron, Ohio, held their annual outing and picnic at Silver Lake, July 15. It was planned to hold the outing at Cedar Point, but inability of railroad companies to furnish equipment made it necessary to hold it nearer home. The day was spent in games and athletic events.

C. A. S. Products Busy—The new plant of the C. A. S. Products Co., Columbus, Ohio, recently formed with a capital of $100,000 to manufacture the Foster gear, an invention of a Columbus man, has booked orders to keep the plant to capacity until June, 1917. C. D. Cutting of Detroit is president and general manager, and A. W. Tyler is secretary and superintendent. The plant has 50,000 sq. ft. of floor space and already additions and extensions have been started. More than 150 men are on the pay rolls.

Leak-Proof Plant Expanded—The McQuay-Norris Mfg. Co., St. Louis, has just completed an addition to its factory which increases the plant by one-third and gives 100 ft. of frontage on Locust Street in the heart of the automobile district.

The Automobile Calendar

ASSOCIATIONS

Aug. 15—Metropolitan Section, S. A. E. Meeting at Automobile Club of America. Subject, "South America."
Aug. 28-Sept. 1—Milwaukee, Wis., Booster Tour of Milwaukee Automobile Dealers.
Sept.—Indianapolis. Convention for Formation of Indiana Automobile Trade Assn., under auspices of N. A. T. A., Hotel Claypool.
Oct. 2-5—St. Louis, Fall Meeting Assn. of Automobile Accessory Jobbers.
Dec. 2-9—Electricians' Country-wide Celebration.

CONTESTS

Aug. 5—Tacoma Speedway Race, Tacoma Speedway Association.
Aug. 11-12—Pikes Peak, Col., Hill Climb, Pikes Peak Auto Highway Co.
Aug. 12—Portland, Ore., Track Race, Hiller-Riegel Co.
Aug. 18-19—Elgin Road Race, Chicago Auto Club.
Aug. 26—Kalamazoo, Mich., 100-Mile Track Race.
Sept. 1-2—New York, N. Y., Sheepshead Bay Speedway, 24-Hour Race, Trade Racing Assn.
Sept. 4—Elmira, N. Y., Track Race, Elmira Auto and Motorcycle Racing Assn.
Sept. 4—Cincinnati, Ohio, Speedway, Cincinnati Speedway Co.
Sept. 4—Newark, N. J., Track Race, Olympic Park, Racing Assn.
Sept. 4—Indianapolis Speedway Race.
Sept. 4—Des Moines Speedway Invitation Race. Limited to six entries.
Sept. 4-5 — Spokane, Wash., Track Race, Inland Auto Assn.
Sept. 16—Providence Speedway Race.
Sept. 18—North Yakima, Wash., Track Race, Washington State Fair.
Sept. 29—Trenton, N. J., Inter-State Fair. H. P. Murphy, Racing Sec.
Sept. 30 — New York City, Sheepshead Bay Speedway Race.
Oct. 7—Philadelphia Speedway Race.
Oct. 7—Omaha Speedway Race.
Oct. 14 — Chicago Speedway Race.
Oct. 19—Indianapolis, Ind., Race, Indianapolis Motor Speedway.
Oct. 21 — Kalamazoo, Mich., Track Races, Kalamazoo, Motor Speedway.
Oct. 22-23—Los Angeles, Cal., Commercial Car Reliability Tour.
Nov. 16 and 18—Santa Monica, Cal., Vanderbilt Cup and Grand Prix Races.

GOOD ROADS

Sept. 6-7—St. Paul, Minn., Good Roads Congress, Auditorium.

SHOWS

Aug. 2-9—Hollywood and West End, N. J., Show, Atlantic Exhibition Co.
Sept. 2-9—Columbus, Ohio, Fall Show, Ohio State Fair, Columbus Automobile Show Co.
Sept. 4-11 — Indianapolis, Ind., Show, Indiana State Fair, Indianapolis Automobile Trade Assn.
Sept. 10-16 — Milwaukee, Wis., Show, Wisconsin State Fair, Machinery Bldg.
Oct. 14 - 31 — Dallas, Texas, Show, State Fair.
Jan. 6-13, 1917—New York City, Show, Grand Central Palace, National Automobile Chamber of Commerce.
Jan. 13-20 — Montreal, Que., Show, Montreal Automobile Trade Assn.
Jan. 27-Feb. 3, 1917 — Chicago, Ill., Show, Coliseum, National Automobile Chamber of Commerce.
Feb.—Newark, N. J., Show, First Regiment Armory.
Feb.—St. Louis, Mo., Show, Auto Manufacturers and Dealers' Assn.

TRACTOR

July 24-28 — Hutchinson, Kan., Tractor Demonstration.
July 31-Aug. 4—St. Louis, Mo., Tractor Demonstration.
Aug. 7-11—Fremont, Neb., Tractor Demonstration.
Aug. 14-18—Cedar Rapids, Iowa, Tractor Demonstration.
Aug. 21-25—Bloomington, Ill., Tractor Demonstration.
Aug. 28-Sept. 1—Indiana Tractor Demonstration.
Sept. 4-8—Madison, Wis., Tractor Demonstration.
Sept. 11-16 — Milwaukee, Wis., Fall Show, Wisconsin State Fair, Milwaukee Automobile Dealers.